MITSUBISHI ELECTRIC

SPLIT-TYPE AIR CONDITIONERS

*Changes for the Better*

**Revision B:**
- Descriptions regarding the outdoor fan motor have been corrected.

Please void OBH549 REVISED EDITION-A.

# OUTDOOR UNIT

# SERVICE MANUAL

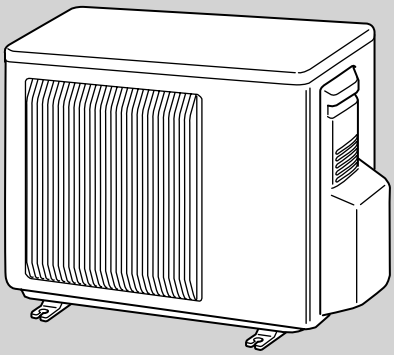
HFC utilized
R410A

**No. OBH549**
**REVISED EDITION-B**

## Models

**MUZ-GE09NA**
**MUZ-GE12NA**
**MUZ-GE15NA**
**MUZ-GE18NA**
**MUZ-GE24NA**
**MUY-GE09NA**
**MUY-GE12NA**
**MUY-GE15NA**
**MUY-GE18NA**
**MUY-GE24NA**

**Indoor unit service manual**
**MSZ-GE•NA MSY-GE•NA Series (OBH548)**



**MUZ-GE09/12/15NA**
**MUY-GE09/12/15NA**

**NOTE:**
RoHS compliant products have <G> mark on the spec name plate.

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**PARTS CATALOG (OBB549)**


Mr.SLIM™

**Revision A:**
• MUZ-GE24NA and MUY-GE24NA have been added.

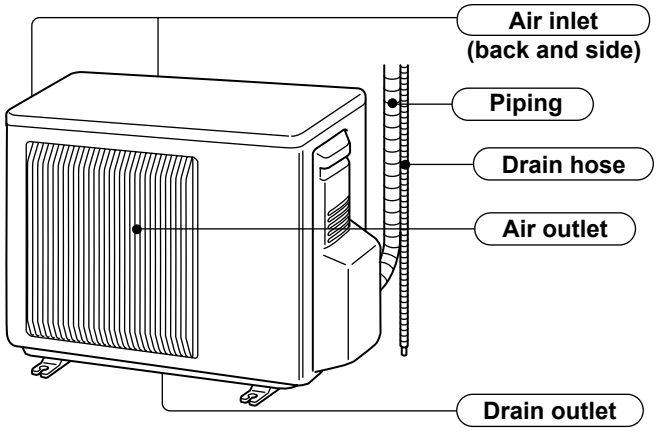
**Revision B:**
• Descriptions regarding the outdoor fan motor have been corrected.

# 1 TECHNICAL CHANGES

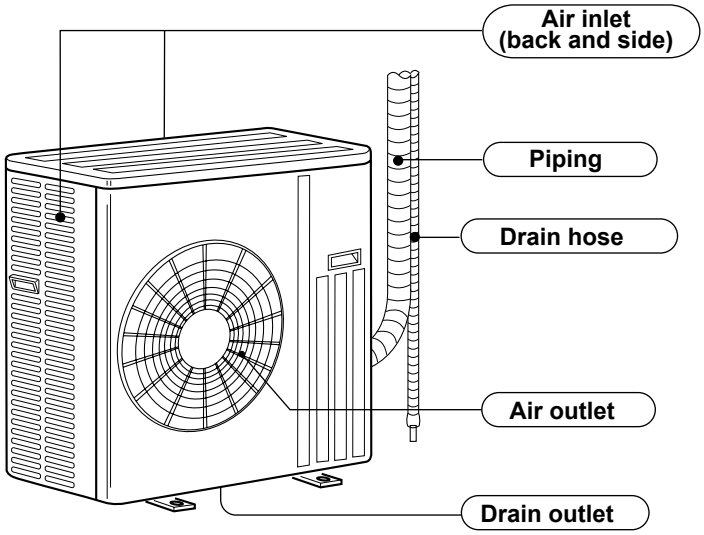
**MUZ-GE09NA**
**MUZ-GE12NA**
**MUZ-GE15NA**
**MUZ-GE18NA**
**MUZ-GE24NA**
**MUY-GE09NA**
**MUY-GE12NA**
**MUY-GE15NA**
**MUY-GE18NA**
**MUY-GE24NA**
1. New model

# 2 PART NAMES AND FUNCTIONS

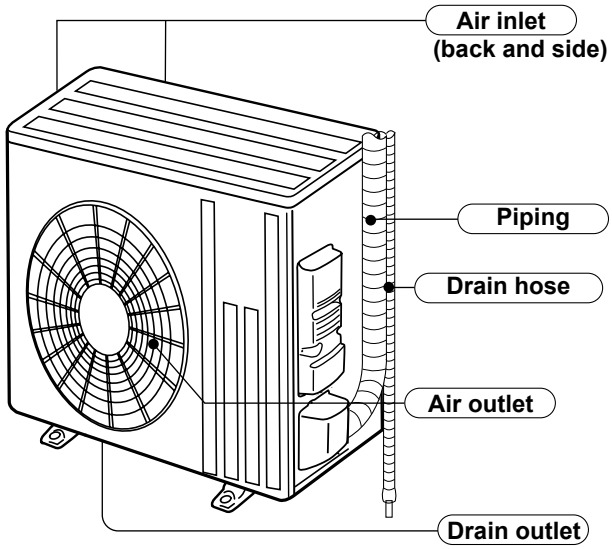
**MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA**
**MUY-GE09NA MUY-GE12NA MUY-GE15NA**




**MUZ-GE18NA MUY-GE18NA**




**MUZ-GE24NA MUY-GE24NA**



# 3 SPECIFICATION

| Outdoor unit model | | | MUZ-GE09NA | MUY-GE09NA | MUZ-GE12NA | MUY-GE12NA |
|---|---|---|---|---|---|---|
| Capacity Rated (Minimum~Maximum) | Cooling ❄1 | Btu/h | 9,000 ( 3,800 ~ 12,200 ) | 9,000 ( 3,800 ~ 12,200 ) | 12,000 ( 3,800 ~ 13,600 ) | 12,000 ( 3,800 ~ 13,600 ) |
| | Heating 47 ❄1 | Btu/h | 10,900 ( 4,500 ~ 14,100 ) | — | 14,400 ( 5,500 ~ 18,100 ) | — |
| Capacity | Heating 17 ❄2 | Btu/h | 8,700 | — | 11,200 | — |
| Power consumption Rated (Minimum~Maximum) | Cooling ❄1 | W | 660 (205~1,200) | 660 (205~1,200) | 960 (205~1,300) | 960 (205~1,300) |
| | Heating 47 ❄1 | W | 760 (255~1,200) | — | 1,170 (340~1,660) | — |
| Power consumption | Heating 17 ❄2 | W | 950 | — | 1,200 | — |
| EER ❄1 [SEER] ❄3 | Cooling | | 13.6 [ 21.0 ] | 13.6 [ 21.0 ] | 12.5 [ 20.5 ] | 12.5 [ 20.5 ] |
| HSPF IV ❄4 | Heating | | 10.0 | — | 10.0 | — |
| COP | Heating ❄1 | | 4.20 | — | 3.61 | — |
| Power supply | V , phase , Hz | | 208/230 , 1 , 60 | | | |
| Max. fuse size (time delay) | | A | 15 | | | |
| Min. circuit ampacity | | A | 12 | 12 | 12 | 12 |
| Fan motor | | F.L.A | 0.50 | | | |
| Compressor | Model | | KNB073FQDHC | | KNB092FQAHC | |
| | | R.L.A | 6.6 | 4.9 | 6.6 | 4.9 |
| | | L.R.A | 8.2 | 6.1 | 8.2 | 6.1 |
| | Refrigeration oil (Model) | L | 0.32 (NEO22) | | | |
| Refrigerant control | | | Linear expansion valve | | | |
| Sound level ❄1 | Cooling | dB(A) | 46 | 46 | 49 | 49 |
| | Heating | dB(A) | 50 | — | 51 | — |
| Defrost method | | | Reverse cycle | | | |
| Dimensions | W | in. | 31-1/2 | | | |
| | D | in. | 11-1/4 | | | |
| | H | in. | 21-5/8 | | | |
| Weight | | lb. | 66 | | 77 | |
| External finish | | | Munsell 3Y 7.8/1.1 | | | |
| Remote controller | | | Wireless type | | | |
| Control voltage (by built-in transformer) | | VDC | 12 - 24 | | | |
| Refrigerant piping | | | Not supplied | | | |
| Refrigerant pipe size (Min. wall thickness) | Liquid | in. | 1/4 (0.0315) | | | |
| | Gas | in. | 3/8 (0.0315) | | | |
| Connection method | Indoor | | Flared | | | |
| | Outdoor | | Flared | | | |
| Between the indoor & outdoor units | Height difference | ft. | 40 | | | |
| | Piping length | ft. | 65 | | | |
| Refrigerant charge (R410A) | | | 1 lb. 12 oz. | | 2 lb. 9 oz. | |

**NOTE**: Test conditions are based on AHRI 210/240.

❄1: Rating conditions (Cooling) — Indoor: 80˚FDB, 67˚FWB, Outdoor: 95˚FDB, (75˚FWB) Rated frequency

(Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 47˚FDB, 43˚FWB Rated frequency

❄2: (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB Maximum frequency

| Outdoor unit model | | | MUZ-GE15NA | MUY-GE15NA | MUZ-GE18NA | MUY-GE18NA |
|---|---|---|---|---|---|---|
| Capacity Rated (Minimum~Maximum) | Cooling ❄1 | Btu/h | 14,000 ( 3,100 ~ 18,200 ) | 14,000 ( 3,100 ~ 18,200 ) | 17,200 ( 3,700 ~ 18,700 ) | 17,200 ( 3,700 ~ 18,700 ) |
| | Heating 47 ❄1 | Btu/h | 18,000 ( 4,800 ~ 20,900 ) | — | 21,600 ( 3,500 ~ 25,200 ) | — |
| Capacity | Heating 17 ❄2 | Btu/h | 15,900 | — | 17,200 | — |
| Power consumption Rated (Minimum~Maximum) | Cooling ❄1 | W | 1,080 (160 ~ 2,000) | 1,080 (160 ~ 2,000) | 1,640 (240 ~ 2,070) | 1,640 (240 ~ 2,070) |
| | Heating 47 ❄1 | W | 1,600 (270 ~ 2,010) | — | 1,900 (230 ~ 2,680) | — |
| Power consumption | Heating 17 ❄2 | W | 1,950 | — | 2,080 | — |
| EER ❄1 [SEER] ❄3 | Cooling | | 13.0 [ 21.0 ] | 13.0 [ 21.0 ] | 10.5 [19.2] | 10.5 [19.2] |
| HSPF IV ❄4 | Heating | | 10.0 | — | 10.0 | — |
| COP | Heating ❄1 | | 3.30 | — | 3.33 | — |
| Power supply | V , phase , Hz | | 208/230 , 1 , 60 | | | |
| Max. fuse size (time delay) | | A | 15 | | | |
| Min. circuit ampacity | | A | 12 | | 14 | |
| Fan motor | | F.L.A | 0.50 | | 0.93 | |
| Compressor | Model | | SNB130FQBH | | | |
| | | R.L.A | 7.4 | 6.8 | 10.0 | 10.0 |
| | | L.R.A | 9.3 | 8.5 | 12.5 | 12.5 |
| | Refrigeration oil (Model) | L | 0.45 (NEO22) | | | |
| Refrigerant control | | | Linear expansion valve | | | |
| Sound level ❄1 | Cooling | dB(A) | 49 | 49 | 54 | 54 |
| | Heating | dB(A) | 51 | — | 56 | — |
| Defrost method | | | Reverse cycle | | | |
| Dimensions | W | in. | 31-1/2 | | 33-1/16 | |
| | D | in. | 11-1/4 | | 13 | |
| | H | in. | 21-5/8 | | 33-7/16 | |
| Weight | | lb. | 80 | | 119 | |
| External finish | | | Munsell 3Y 7.8/1.1 | | | |
| Remote controller | | | Wireless type | | | |
| Control voltage (by built-in transformer) | | VDC | 12 - 24 | | | |
| Refrigerant piping | | | Not supplied | | | |
| Refrigerant pipe size (Min. wall thickness) | Liquid | in. | 1/4 (0.0315) | | | |
| | Gas | in. | 1/2 (0.0315) | | | |
| Connection method | Indoor | | Flared | | | |
| | Outdoor | | Flared | | | |
| Between the indoor & outdoor units | Height difference | ft. | 40 | | 50 | |
| | Piping length | ft. | 65 | | 100 | |
| Refrigerant charge (R410A) | | | 2 lb. 9 oz. | | 3 lb. 7 oz. | |

**NOTE**: Test conditions are based on AHRI 210/240.

❄1: Rating conditions (Cooling) — Indoor: 80˚FDB, 67˚FWB, Outdoor: 95˚FDB, (75˚FWB) Rated frequency
(Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 47˚FDB, 43˚FWB Rated frequency

❄2: (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB Maximum frequency

| Outdoor unit model | | | MUZ-GE24NA | MUY-GE24NA |
|---|---|---|---|---|
| Capacity Rated (Minimum~Maximum) | Cooling ❄1 | Btu/h | 22,500 (8,200 ~ 31,400) | 22,500 (8,200 ~ 31,400) |
| | Heating 47 ❄1 | Btu/h | 27,600 (7,500 ~ 36,900) | — |
| Capacity | Heating 17 ❄2 | Btu/h | 24,600 | — |
| Power consumption Rated (Minimum~Maximum) | Cooling ❄1 | W | 1,800 (570 ~ 3,580) | 1,800 (570 ~ 3,580) |
| | Heating 47 ❄1 | W | 2,340 (520 ~ 3,650) | — |
| Power consumption | Heating 17 ❄2 | W | 3,290 | — |
| EER ❄1 [SEER] ❄3 | Cooling | | 12.5 [19.0] | 12.5 [19.0] |
| HSPF IV ❄4 | Heating | | 10.0 | — |
| COP | Heating ❄1 | | 3.46 | — |
| Power supply | V , phase , Hz | | 208/230 , 1 , 60 | |
| Max. fuse size (time delay) | | A | 20 | |
| Min. circuit ampacity | | A | 17.1 | |
| Fan motor | | F.L.A | 0.93 | |
| Compressor | Model | | SNB172FQKMT | |
| | | R.L.A | 12.9 | |
| | | L.R.A | 16.1 | |
| | Refrigeration oil (Model) | L | 0.40 (FV50S) | |
| Refrigerant control | | | Linear expansion valve | |
| Sound level ❄1 | Cooling | dB(A) | 55 | 55 |
| | Heating | dB(A) | 55 | — |
| Defrost method | | | Reverse cycle | |
| Dimensions | W | in. | 33-1/16 | |
| | D | in. | 13 | |
| | H | in. | 34-5/8 | |
| Weight | | lb. | 119 | |
| External finish | | | Munsell 3Y 7.8/1.1 | |
| Remote controller | | | Wireless type | |
| Control voltage (by built-in transformer) | | VDC | 12-24 | |
| Refrigerant piping | | | Not supplied | |
| Refrigerant pipe size (Min. wall thickness) | Liquid | in. | 3/8 (0.0315) | |
| | Gas | in. | 5/8 (0.0315) | |
| Connection method | Indoor | | Flared | |
| | Outdoor | | Flared | |
| Between the indoor & outdoor units | Height difference | ft. | 50 | |
| | Piping length | ft. | 100 | |
| Refrigerant charge (R410A) | | | 4 lb. 3 oz. | |

**NOTE**: Test conditions are based on AHRI 210/240.

❄1: Rating conditions (Cooling) — Indoor: 80˚FDB, 67˚FWB, Outdoor: 95˚FDB, (75˚FWB) Rated frequency

(Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 47˚FDB, 43˚FWB Rated frequency

❄2: (Heating) — Indoor: 70˚FDB, 60˚FWB, Outdoor: 17˚FDB, 15˚FWB Maximum frequency

## Test condition

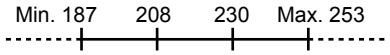
⁂3,⁂4

| ARI | Mode | Test | Indoor air condition (°F) | | Outdoor air condition (°F) | |
|---|---|---|---|---|---|---|
| | | | Dry bulb | Wet bulb | Dry bulb | Wet bulb |
| | SEER (Cooling) | "A-2" Cooling Steady State at rated compressor Speed | 80 | 67 | 95 | (75) |
| | | "B-2" Cooling Steady State at rated compressor Speed | 80 | 67 | 82 | (65) |
| | | "B-1" Cooling Steady State at minimum compressor Speed | 80 | 67 | 82 | (65) |
| | | "F-1" Cooling Steady State at minimum compressor Speed | 80 | 67 | 67 | (53.5) |
| | | "E-V" Cooling Steady State at Intermediate compressor Speed ⁂5 | 80 | 67 | 87 | (69) |
| | HSPF (Heating) **(MUZ)** | "H1-2" Heating Steady State at rated compressor Speed | 70 | 60 | 47 | 43 |
| | | "H3-2" Heating at rated compressor Speed | 70 | 60 | 17 | 15 |
| | | "H0-1" Heating Steady State at minimum compressor Speed | 70 | 60 | 62 | 56.5 |
| | | "H1-1" Heating Steady State at minimum compressor Speed | 70 | 60 | 47 | 43 |
| | | "H2-V" Heating at Intermediate compressor Speed ⁂5 | 70 | 60 | 35 | 33 |

⁂5: At Intermediate compressor Speed
= ("Cooling rated compressor speed" - "minimum compressor speed") / 3 + "minimum compressor speed".

### 3-1. OPERATING RANGE

(1) POWER SUPPLY

| | Rated voltage | Guaranteed voltage (V) |
|---|---|---|
| Outdoor unit | 208/230 V<br>1 phase<br>60 Hz |  |

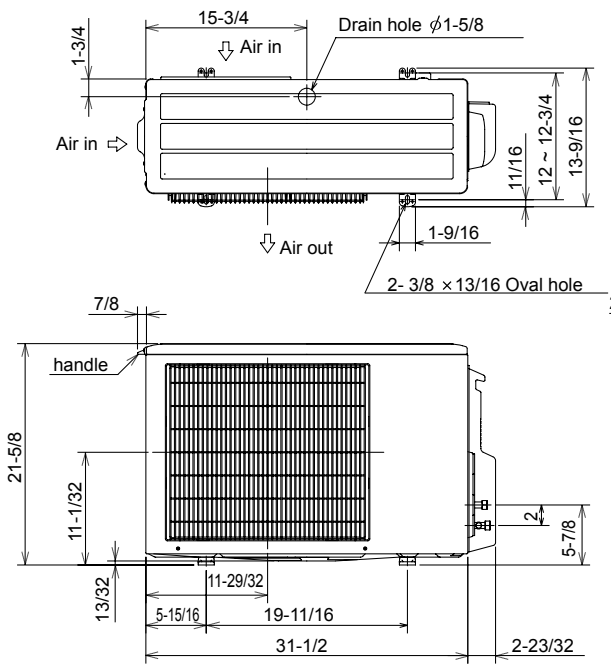
(2) OPERATION

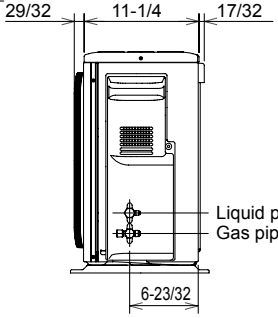
| Mode | Condition | Intake air temperature (°F) | | | |
|---|---|---|---|---|---|
| | | Indoor | | Outdoor | |
| | | DB | WB | DB | WB |
| Cooling | Standard temperature | 80 | 67 | 95 | — |
| | Maximum temperature | 90 | 73 | 115 | — |
| | Minimum temperature | 67 | 57 | 14 | — |
| | Maximum humidity | 78 % | | — | |
| Heating **(MUZ)** | Standard temperature | 70 | 60 | 47 | 43 |
| | Maximum temperature | 80 | 67 | 75 | 65 |
| | Minimum temperature | 70 | 60 | -4 | -5 |

# 4 OUTLINES AND DIMENSIONS

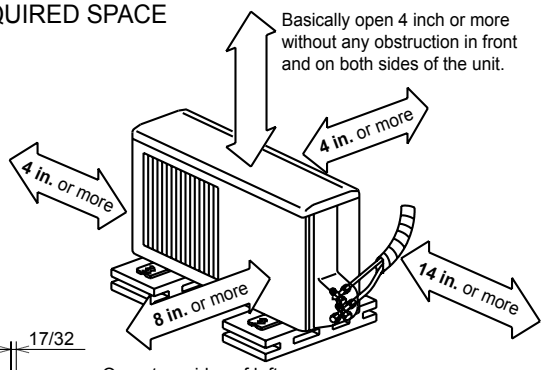
## MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA
## MUY-GE09NA MUY-GE12NA MUY-GE15NA

**Unit: inch**



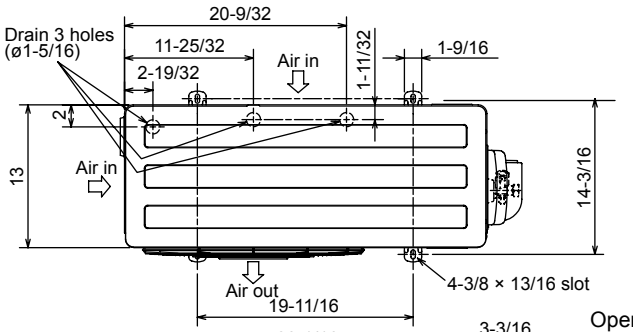

REQUIRED SPACE

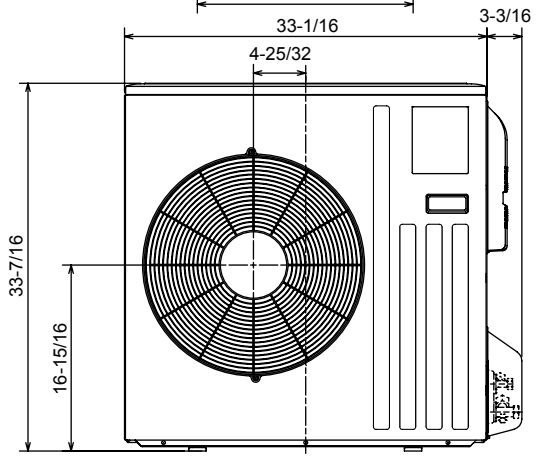

Basically open 4 inch or more without any obstruction in front and on both sides of the unit.
4 in. or more
4 in. or more
8 in. or more
14 in. or more

Open two sides of left, right, or rear side.

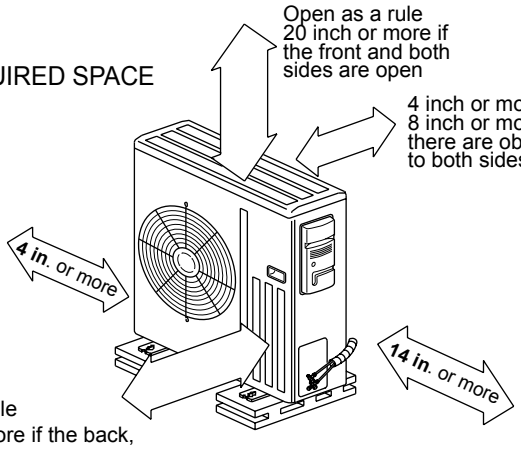
Liquid pipe :1/4 (flared)
Gas pipe :3/8 (flared) **(GE09/12)**
1/2 (flared) **(GE15)**

## MUZ-GE18NA MUY-GE18NA

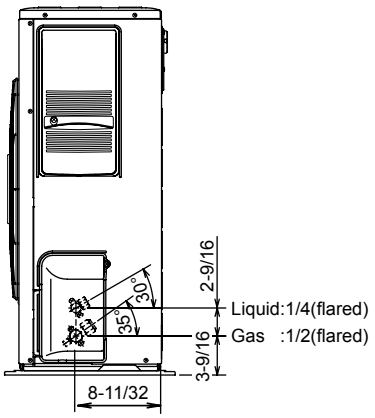



REQUIRED SPACE

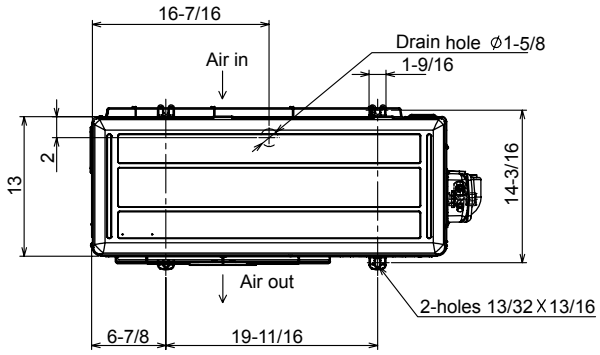

Open as a rule
20 inch or more if the front and both sides are open
4 inch or more/
8 inch or more if there are obstacles to both sides
4 in. or more
14 in. or more

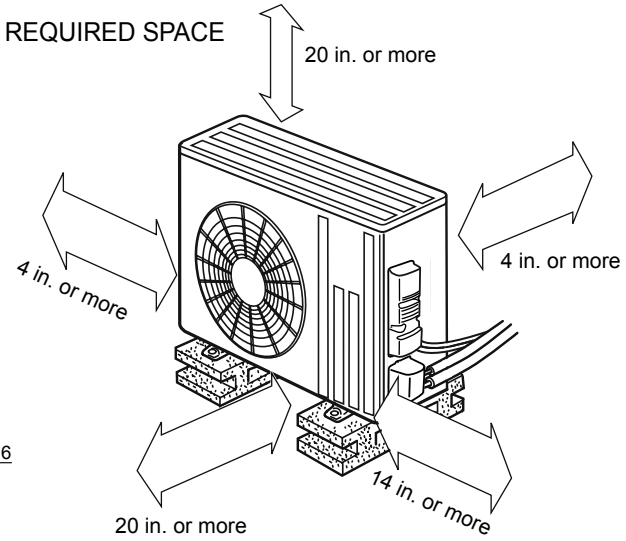
Open as a rule
20 inch or more if the back, both sides and top are open

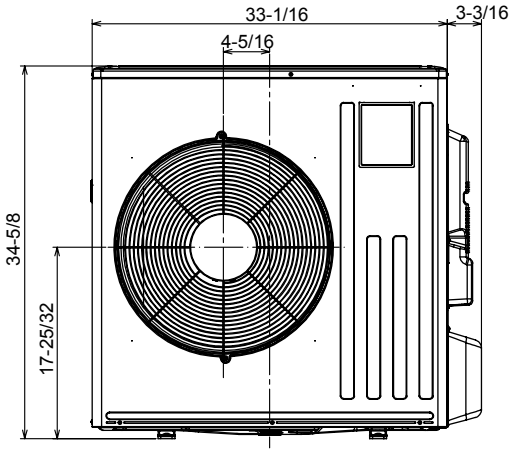


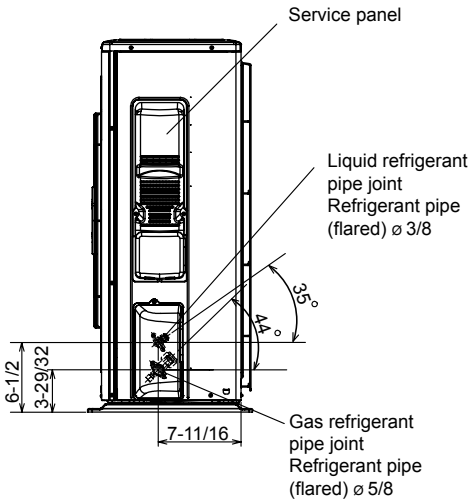
**MUZ-GE24NA**
**MUY-GE24NA**

**Unit: inch**



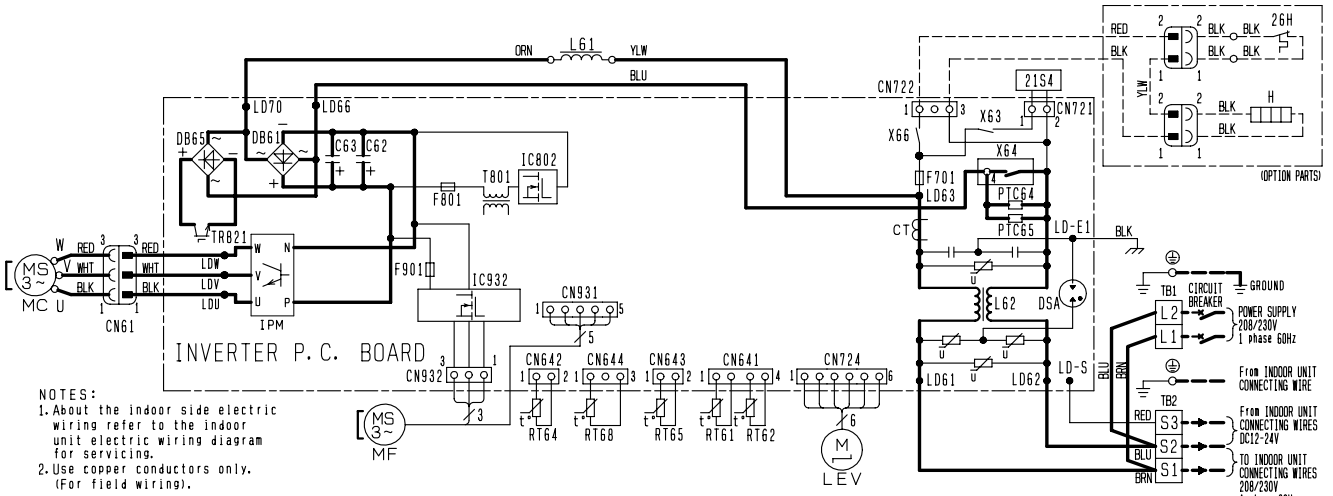



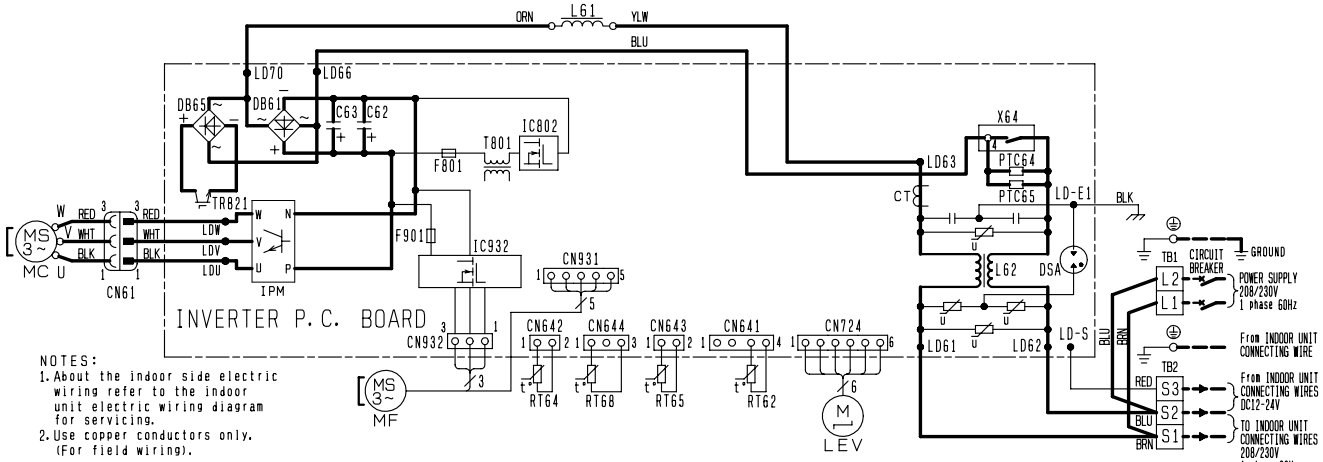
# 5 WIRING DIAGRAM

## MUZ-GE09NA MUZ-GE12NA



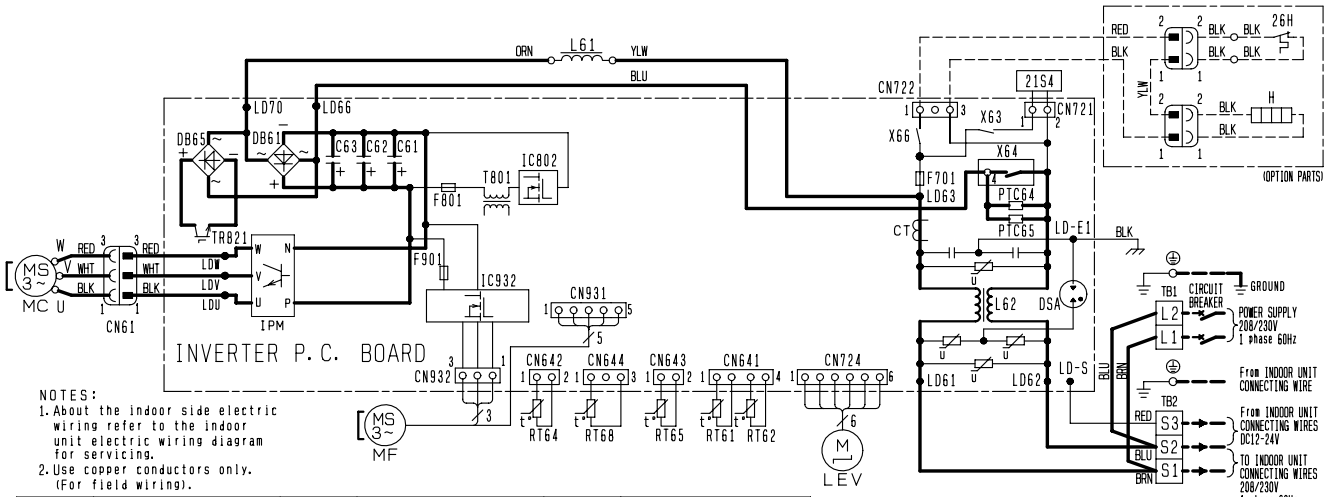

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| CT | CURRENT TRANSFORMER | L62 | CMC COIL | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR. |
| C62, C63 | SMOOTHING CAPACITOR | LEV | EXPANSION VALVE COIL | | |
| DB61, DB65 | DIODE MODULE | MC | COMPRESSOR | TB1, TB2 | TERMINAL BLOCK |
| DSA | SURGE ABSORBER | MF | FAN MOTOR | TR821 | SWITCHING POWER TRANSISTOR |
| F701, F801, F901 | FUSE (T3.15AL250V) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| H | DEFROST HEATER(OPTION PARTS) | RT61 | DEFROST THERMISTOR | X63, X64, X66 | RELAY |
| IC802 | INTELLIGENT POWER DEVICE | RT62 | DISCHARGE TEMP. THERMISTOR | 21S4 | REVERSING VALVE COIL |
| IPM, IC932 | INTELLIGENT POWER MODULE | RT64 | FIN TEMP. THERMISTOR | 26H | HEATER PROTECTOR(OPTION PARTS) |
| L61 | REACTOR | RT65 | AMBIENT TEMP. THERMISTOR | | |

## MUY-GE09NA MUY-GE12NA




| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| CT | CURRENT TRANSFORMER | L62 | CMC COIL | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR. |
| C62, C63 | SMOOTHING CAPACITOR | LEV | EXPANSION VALVE COIL | | |
| DB61, DB65 | DIODE MODULE | MC | COMPRESSOR | TB1, TB2 | TERMINAL BLOCK |
| DSA | SURGE ABSORBER | MF | FAN MOTOR | TR821 | SWITCHING POWER TRANSISTOR |
| F801, F901 | FUSE (T3.15AL250V) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| IC802 | INTELLIGENT POWER DEVICE | RT62 | DISCHARGE TEMP. THERMISTOR | X64 | RELAY |
| IPM, IC932 | INTELLIGENT POWER MODULE | RT64 | FIN TEMP. THERMISTOR | | |
| L61 | REACTOR | RT65 | AMBIENT TEMP. THERMISTOR | | |

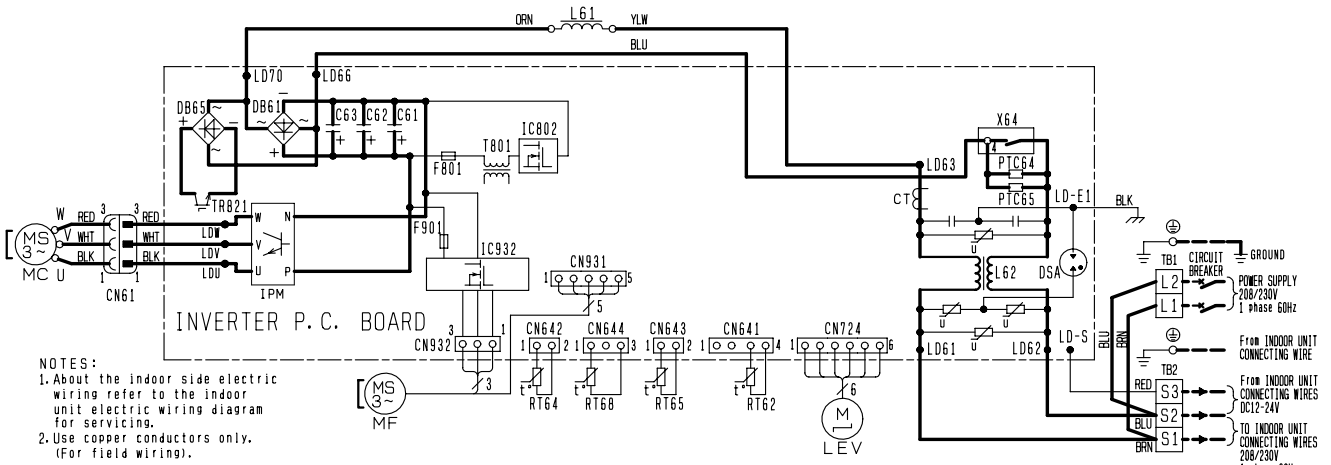
## MUZ-GE15NA




NOTES:
1. About the indoor side electric wiring refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only. (For field wiring).

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| CT | CURRENT TRANSFORMER | L62 | CMC COIL | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR. |
| C61, C62, C63 | SMOOTHING CAPACITOR | LEV | EXPANSION VALVE COIL | | |
| DB61, DB65 | DIODE MODULE | MC | COMPRESSOR | TB1, TB2 | TERMINAL BLOCK |
| DSA | SURGE ABSORBER | MF | FAN MOTOR | TR821 | SWITCHING POWER TRANSISTOR |
| F701, F801, F901 | FUSE (T3.15AL250V) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| H | DEFROST HEATER(OPTION PARTS) | RT61 | DEFROST THERMISTOR | X63, X64, X66 | RELAY |
| IC802 | INTELLIGENT POWER DEVICE | RT62 | DISCHARGE TEMP. THERMISTOR | 21S4 | REVERSING VALVE COIL |
| IPM, IC932 | INTELLIGENT POWER MODULE | RT64 | FIN TEMP. THERMISTOR | 26H | HEATER PROTECTOR(OPTION PARTS) |
| L61 | REACTOR | RT65 | AMBIENT TEMP. THERMISTOR | | |

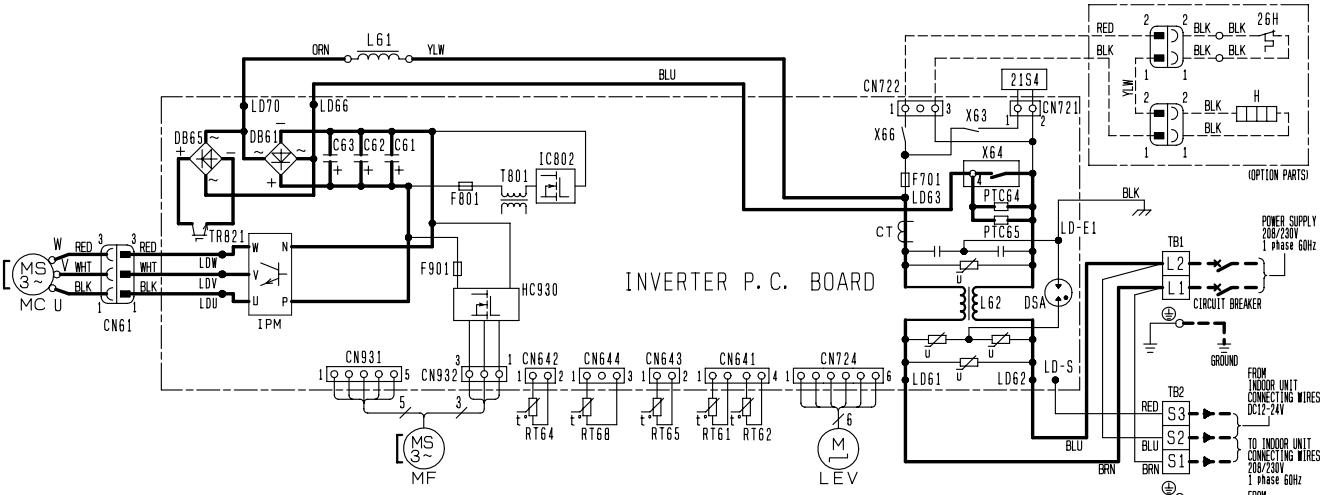
## MUY-GE15NA




NOTES:
1. About the indoor side electric wiring refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only. (For field wiring).

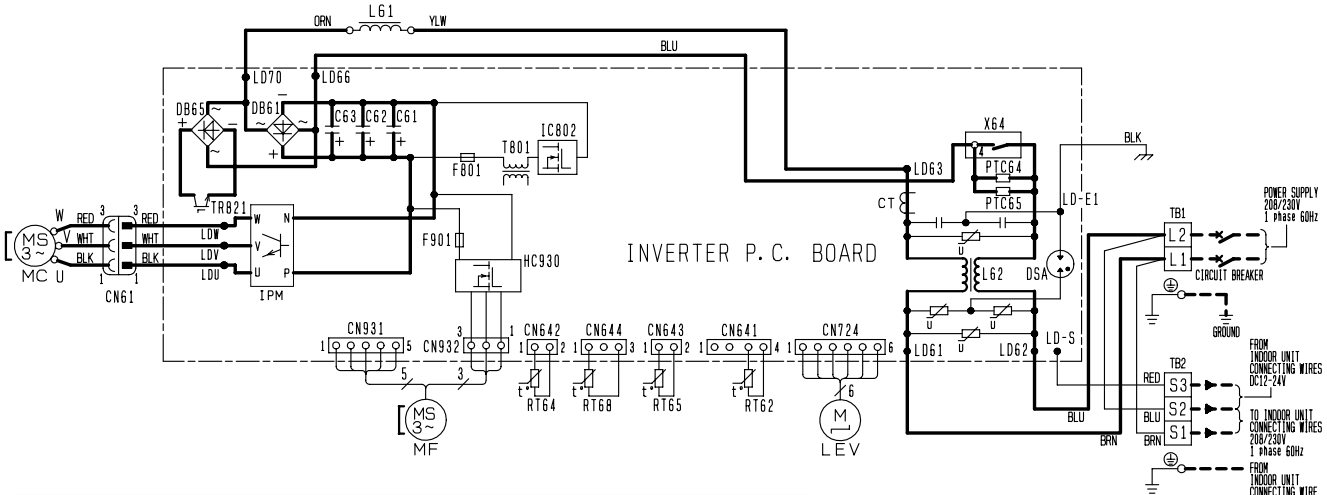
| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| CT | CURRENT TRANSFORMER | L62 | CMC COIL | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR. |
| C61, C62, C63 | SMOOTHING CAPACITOR | LEV | EXPANSION VALVE COIL | | |
| DB61, DB65 | DIODE MODULE | MC | COMPRESSOR | TB1, TB2 | TERMINAL BLOCK |
| DSA | SURGE ABSORBER | MF | FAN MOTOR | TR821 | SWITCHING POWER TRANSISTOR |
| F801, F901 | FUSE (T3.15AL250V) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| IC802 | INTELLIGENT POWER DEVICE | RT62 | DISCHARGE TEMP. THERMISTOR | X64 | RELAY |
| IPM, IC932 | INTELLIGENT POWER MODULE | RT64 | FIN TEMP. THERMISTOR | | |
| L61 | REACTOR | RT65 | AMBIENT TEMP. THERMISTOR | | |

## MUZ-GE18NA



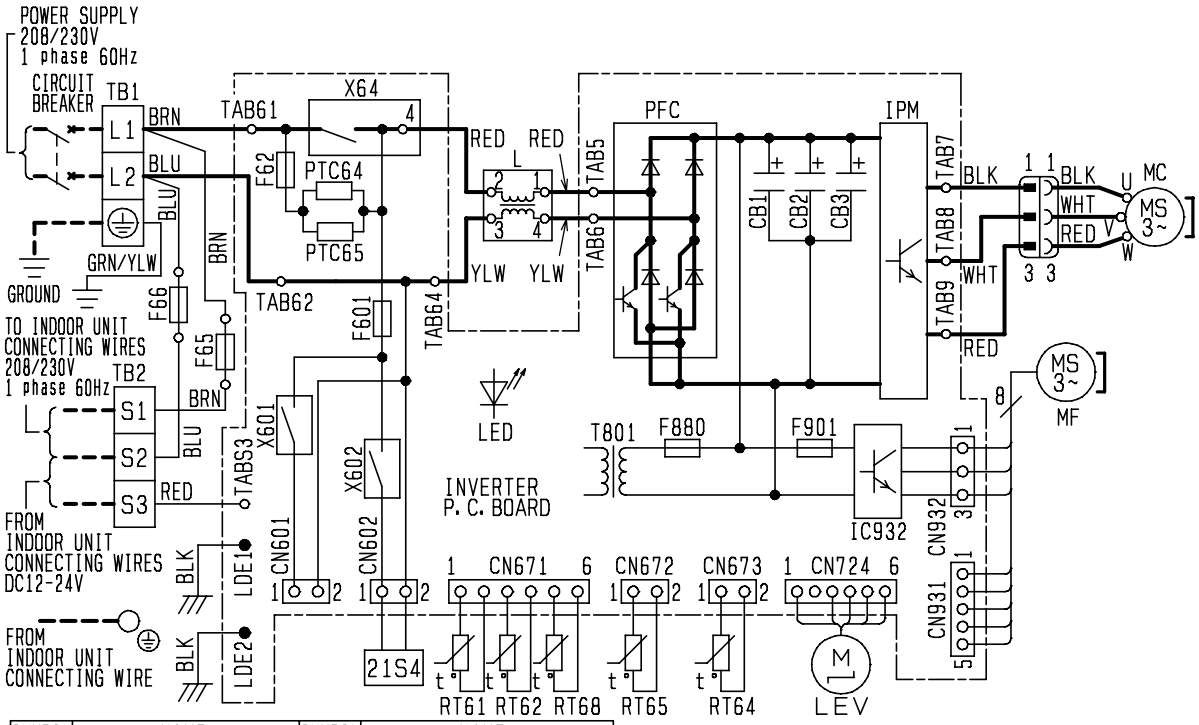

| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| CT | CURRENT TRANSFORMER | L62 | CMC COIL | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR. |
| C61, C62, C63 | SMOOTHING CAPACITOR | LEV | EXPANSION VALVE COIL | | |
| DB61, DB65 | DIODE MODULE | MC | COMPRESSOR | TB1, TB2 | TERMINAL BLOCK |
| DSA | SURGE ABSORBER | MF | FAN MOTOR | TR821 | SWITCHING POWER TRANSISTOR |
| F701, F801, F901 | FUSE (T3.15AL250V) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| H | DEFROST HEATER (OPTION PARTS) | RT61 | DEFROST THERMISTOR | X63, X64, X66 | RELAY |
| HC930, IPM | INTELLIGENT POWER MODULE | RT62 | DISCHARGE TEMP. THERMISTOR | 21S4 | REVERSING VALVE COIL |
| IC802 | INTELLIGENT POWER DEVICE | RT64 | FIN TEMP. THERMISTOR | 26H | HEATER PROTECTOR (OPTION PARTS) |
| L61 | REACTOR | RT65 | AMBIENT TEMP. THERMISTOR | | |

## MUY-GE18NA




| SYMBOL | NAME | SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|---|---|
| CT | CURRENT TRANSFORMER | L62 | CMC COIL | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR. |
| C61, C62, C63 | SMOOTHING CAPACITOR | LEV | EXPANSION VALVE COIL | | |
| DB61, DB65 | DIODE MODULE | MC | COMPRESSOR | TB1, TB2 | TERMINAL BLOCK |
| DSA | SURGE ABSORBER | MF | FAN MOTOR | TR821 | SWITCHING POWER TRANSISTOR |
| F801, F901 | FUSE (T3.15AL250V) | PTC64, PTC65 | CIRCUIT PROTECTION | T801 | TRANSFORMER |
| HC930, IPM | INTELLIGENT POWER MODULE | RT62 | DISCHARGE TEMP. THERMISTOR | X64 | RELAY |
| IC802 | INTELLIGENT POWER DEVICE | RT64 | FIN TEMP. THERMISTOR | | |
| L61 | REACTOR | RT65 | AMBIENT TEMP. THERMISTOR | | |

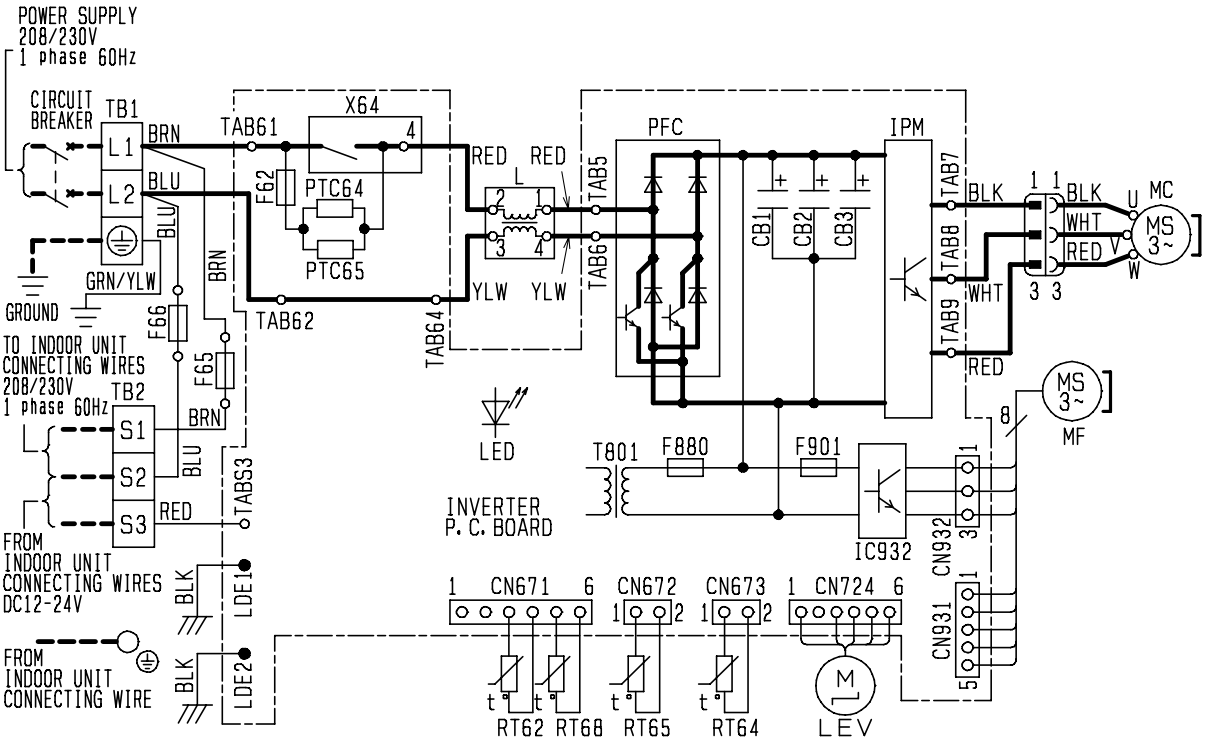
## MUZ-GE24NA




| SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|
| CB1~3 | SMOOTHING CAPACITOR | PTC64 | CIRCUIT PROTECTION |
| F601 | FUSE(T3.15AL250V) | PTC65 | CIRCUIT PROTECTION |
| F62 | FUSE(T2AL250V) | RT61 | DEFROST THERMISTOR |
| F65,F66 | FUSE(T6.3AL250V) | RT62 | DISCHARGE TEMP.THERMISTOR |
| F880 | FUSE(T3.15AL250V) | RT64 | FIN TEMP.THERMISTOR |
| F901 | FUSE(T3.15AL250V) | RT65 | AMBIENT TEMP.THERMISTOR |
| IC932 | INTELLIGENT POWER MODULE | RT68 | OUTDOOR HEAT EXCHANGER TEMP.THERMISTOR |
| IPM | INTELLIGENT POWER MODULE | | |
| L | REACTOR | TB1,TB2 | TERMINAL BLOCK |
| LEV | EXPANSION VALVE COIL | T801 | TRANSFORMER |
| MC | COMPRESSOR | X601,X602 | RELAY |
| MF | FAN MOTOR | X64 | RELAY |
| PFC | POWER FACTOR CONTROLLER | 21S4 | REVERSING VALVE SOLENOID COIL |

NOTES 1. About the indoor side electric wiring, refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only(for field wiring).
3. Symbols indicate. ⊟⊟:Terminal block

## MUY-GE24NA



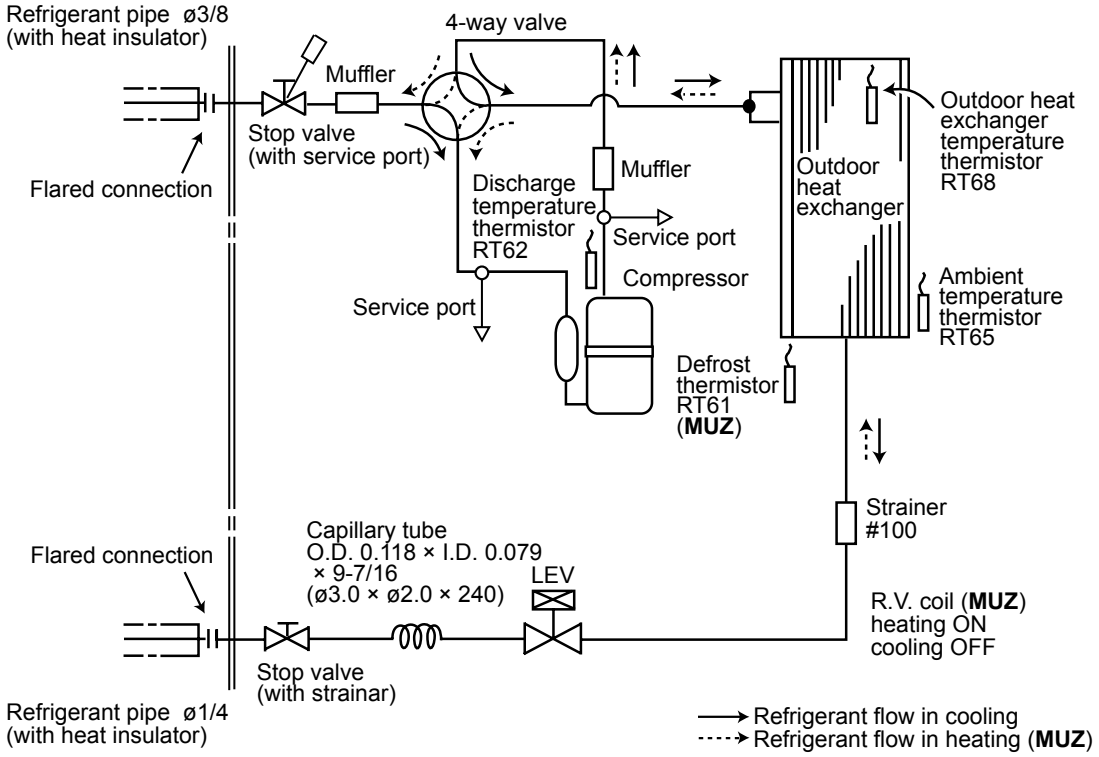

| SYMBOL | NAME | SYMBOL | NAME |
|---|---|---|---|
| CB1~3 | SMOOTHING CAPACITOR | PFC | POWER FACTOR CONTROLLER |
| F62 | FUSE (T2AL250V) | PTC64 | CIRCUIT PROTECTION |
| F65, F66 | FUSE (T6.3AL250V) | PTC65 | CIRCUIT PROTECTION |
| F880 | FUSE (T3.15AL250V) | RT62 | DISCHARGE TEMP. THERMISTOR |
| F901 | FUSE (T3.15AL250V) | RT64 | FIN TEMP. THERMISTOR |
| IC932 | INTELLIGENT POWER MODULE | RT65 | AMBIENT TEMP. THERMISTOR |
| IPM | INTELLIGENT POWER MODULE | RT68 | OUTDOOR HEAT EXCHANGER TEMP. THERMISTOR |
| L | REACTOR | | |
| LEV | EXPANSION VALVE COIL | TB1, TB2 | TERMINAL BLOCK |
| MC | COMPRESSOR | T801 | TRANSFORMER |
| MF | FAN MOTOR | X64 | RELAY |

NOTES 1. About the indoor side electric wiring,
refer to the indoor unit electric wiring diagram for servicing.
2. Use copper conductors only (for field wiring).
3. Symbols indicate. □□□ : Terminal block

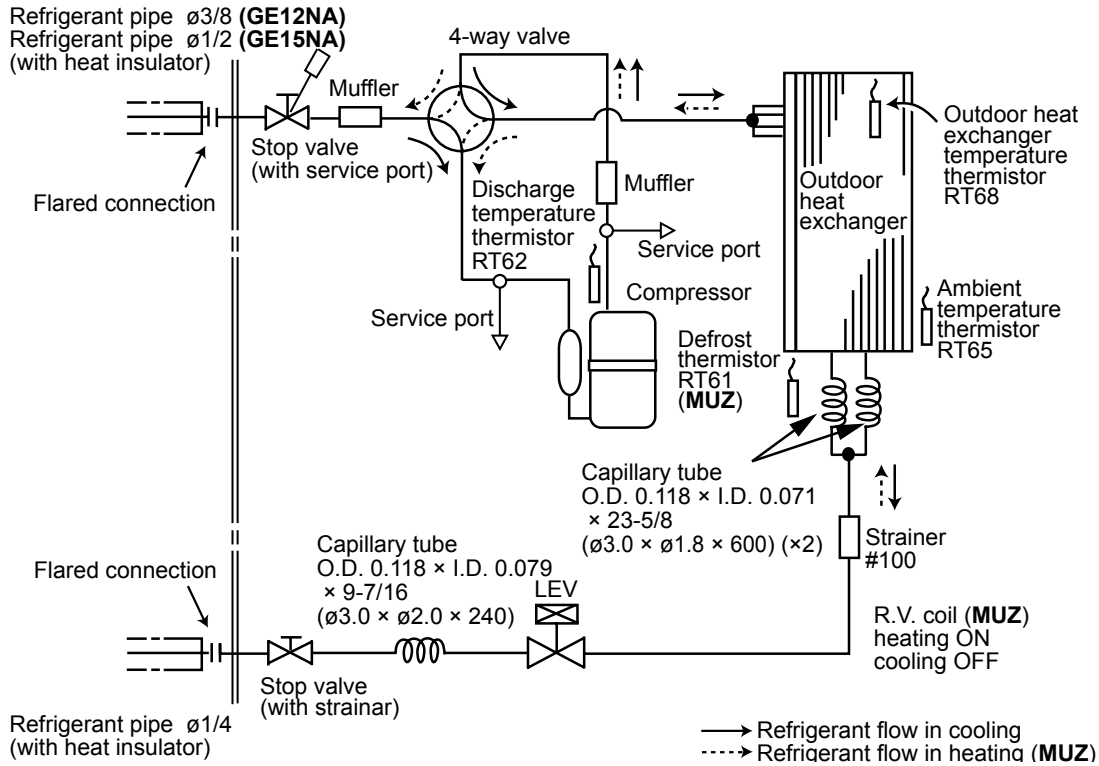
# 6 REFRIGERANT SYSTEM DIAGRAM

## MUZ-GE09NA MUY-GE09NA

**Unit: inch**

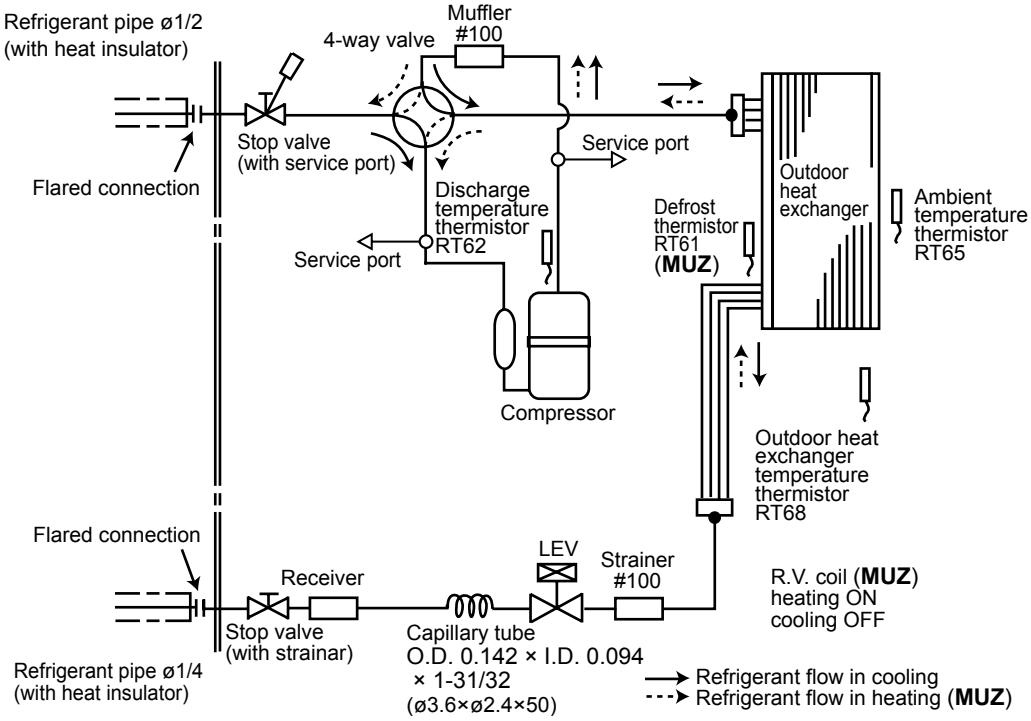



## MUZ-GE12NA MUZ-GE15NA MUY-GE12NA MUY-GE15NA

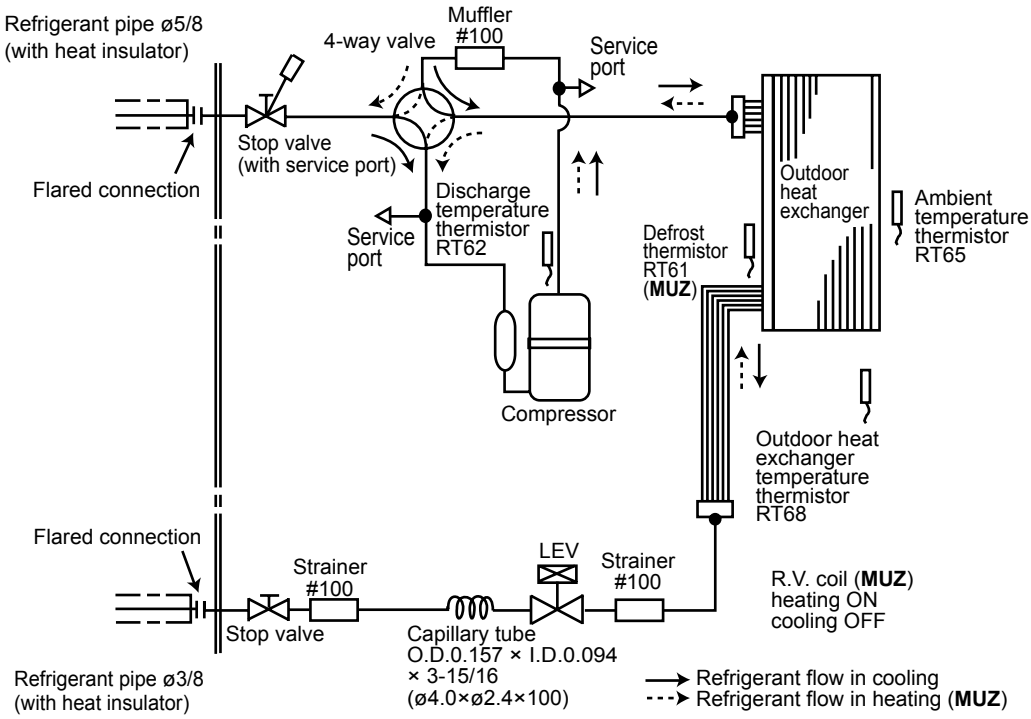


## MUZ-GE18NA MUY-GE18NA

**Unit: inch**

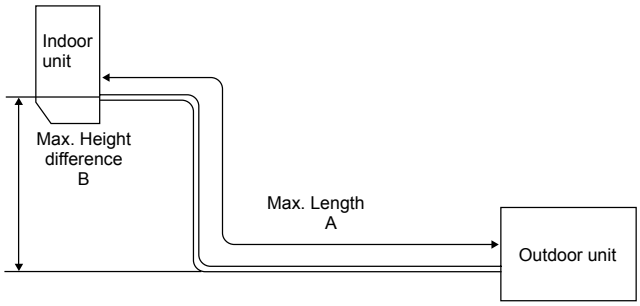



## MUZ-GE24NA MUY-GE24NA



## MAX. REFRIGERANT PIPING LENGTH and MAX. HEIGHT DIFFERENCE

| Model | Refrigerant piping: ft. | | Piping size O.D: in. | |
|---|---|---|---|---|
| | Max. Length A | Max. Height difference B | Gas | Liquid |
| **MUZ-GE09/12/15NA MUY-GE09/12/15NA** | 65 | 40 | 3/8 **(GE09/12)** 1/2 **(GE15)** | 1/4 |
| **MUZ-GE18NA MUY-GE18NA** | 100 | 50 | 1/2 | |
| **MUZ-GE24NA MUY-GE24NA** | 100 | 50 | 5/8 | 3/8 |




## ADDITIONAL REFRIGERANT CHARGE (R410A: oz.)

**NOTE**: Refrigerant piping exceeding 25 ft. requires additional refrigerant charge according to the calculation.

| Model | Outdoor unit precharged | Refrigerant piping length (one way): ft. | | | | | |
|---|---|---|---|---|---|---|---|
| | | 25 | 30 | 40 | 50 | 60 | 65 |
| **MUZ-GE09NA MUY-GE09NA** | 1 lb. 12 oz. | 0 | 1.62 | 4.86 | 8.10 | 11.34 | 12.96 |
| **MUZ-GE12NA MUY-GE12NA** | 2 lb. 9 oz. | | | | | | |
| **MUZ-GE15NA MUY-GE15NA** | | | | | | | |

Calculation: X oz. = 1.62/5 oz. / ft. × (Refrigerant piping length (ft.) - 25)

| Model | Outdoor unit precharged | Refrigerant piping length (one way): ft. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| **MUZ-GE18NA MUY-GE18NA** | 3 lb. 7 oz. | 0 | 1.08 | 3.24 | 5.40 | 7.56 | 9.72 | 11.88 | 14.04 | 16.20 |

Calculation: X oz. = 1.08/5 oz. / ft. × (Refrigerant piping length (ft.) - 25)

**NOTE**: Refrigerant piping exceeding 33 ft. requires additional refrigerant charge according to the calculation.

| Model | Outdoor unit precharged | Refrigerant piping length (one way): ft. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 33 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| **MUZ-GE24NA MUY-GE24NA** | 4 lb. 3 oz. | 0 | 4.14 | 10.06 | 15.98 | 21.90 | 27.82 | 33.74 | 39.66 |

Calculation: X oz. = 2.96/5 oz. / ft. × (Refrigerant piping length (ft.) - 33)

# 7 DATA

## 7-1. PERFORMANCE DATA

### 1) COOLING CAPACITY

**MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA MUZ-GE18NA MUZ-GE24NA**
**MUY-GE09NA MUY-GE12VA MUY-GE15VA MUY-GE18VA MUY-GE24VA**

| Model | Indoor air IWB (˚F) | Outdoor intake air DB temperature (˚F) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 75 | | | 85 | | | 95 | | | 105 | | | 115 | | |
| | | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC | TC | SHC | TPC |
| **MUZ-GE09NA MUY-GE09NA** | 71 | 11.0 | 7.6 | 0.59 | 10.3 | 7.1 | 0.64 | 9.7 | 6.6 | 0.69 | 9.0 | 6.2 | 0.73 | 8.3 | 5.7 | 0.76 |
| | 67 | 10.4 | 8.6 | 0.55 | 9.7 | 8.0 | 0.61 | 9.0 | 7.4 | 0.66 | 8.4 | 6.9 | 0.70 | 7.7 | 6.3 | 0.73 |
| | 63 | 9.8 | 9.4 | 0.53 | 9.1 | 8.7 | 0.58 | 8.5 | 8.1 | 0.63 | 7.7 | 7.3 | 0.67 | 7.0 | 6.7 | 0.70 |
| **MUZ-GE12NA MUY-GE12NA** | 71 | 14.7 | 8.9 | 0.85 | 13.7 | 8.3 | 0.94 | 12.9 | 7.8 | 1.01 | 12.0 | 7.3 | 1.06 | 11.0 | 6.7 | 1.10 |
| | 67 | 13.9 | 10.3 | 0.81 | 13.0 | 9.6 | 0.89 | 12.0 | 8.9 | 0.96 | 11.2 | 8.3 | 1.02 | 10.3 | 7.6 | 1.07 |
| | 63 | 13.1 | 11.4 | 0.77 | 12.1 | 10.6 | 0.85 | 11.3 | 9.9 | 0.92 | 10.3 | 9.0 | 0.98 | 9.4 | 8.2 | 1.02 |
| **MUZ-GE15NA MUY-GE15NA** | 71 | 17.2 | 11.4 | 0.96 | 16.0 | 10.7 | 1.05 | 15.1 | 10.0 | 1.13 | 14.0 | 9.3 | 1.19 | 12.9 | 8.6 | 1.24 |
| | 67 | 16.2 | 13.0 | 0.91 | 15.1 | 12.1 | 1.00 | 14.0 | 11.2 | 1.08 | 13.0 | 10.4 | 1.14 | 12.0 | 9.6 | 1.20 |
| | 63 | 15.3 | 14.2 | 0.86 | 14.1 | 13.2 | 0.96 | 13.2 | 12.3 | 1.03 | 12.0 | 11.2 | 1.10 | 10.9 | 10.2 | 1.14 |
| **MUZ-GE18NA MUY-GE18NA** | 71 | 21.1 | 12.2 | 1.46 | 19.7 | 11.4 | 1.60 | 18.5 | 10.7 | 1.72 | 17.2 | 9.9 | 1.81 | 15.8 | 9.1 | 1.89 |
| | 67 | 20.0 | 14.2 | 1.38 | 18.6 | 13.2 | 1.52 | 17.2 | 12.2 | 1.64 | 16.0 | 11.4 | 1.74 | 14.7 | 10.4 | 1.82 |
| | 63 | 18.7 | 15.8 | 1.31 | 17.4 | 14.7 | 1.45 | 16.2 | 13.6 | 1.57 | 14.7 | 12.4 | 1.67 | 13.4 | 11.3 | 1.74 |
| **MUZ-GE24NA MUY-GE24NA** | 71 | 27.6 | 17.0 | 1.60 | 25.8 | 15.9 | 1.76 | 24.2 | 14.9 | 1.89 | 22.5 | 13.9 | 1.99 | 20.7 | 12.8 | 2.07 |
| | 67 | 26.1 | 19.6 | 1.51 | 24.3 | 18.2 | 1.67 | 22.5 | 16.9 | 1.80 | 20.9 | 15.7 | 1.91 | 19.2 | 14.4 | 2.00 |
| | 63 | 24.5 | 21.7 | 1.44 | 22.7 | 20.1 | 1.59 | 21.2 | 18.7 | 1.72 | 19.2 | 17.0 | 1.84 | 17.6 | 15.5 | 1.91 |

**NOTE**: 1. IWB: Intake air wet-bulb temperature
TC: Total Capacity ($\times 10^3$ Btu/h)
SHC: Sensible Heat Capacity ($\times 10^3$ Btu/h)
TPC: Total Power Consumption (kW)
2. SHC is based on 80˚F of indoor Intake air DB temperature.

### 2) COOLING CAPACITY CORRECTIONS

| | Refrigerant piping length (one way: ft.) | | | |
|---|---|---|---|---|
| | 25 (std.) | 40 | 65 | 100 |
| **MUZ-GE09NA MUY-GE09NA MUZ-GE12NA MUY-GE12NA MUZ-GE15NA MUY-GE15NA MUZ-GE18NA MUY-GE18NA** | 1.0 | 0.954 | 0.878 | — |
| **MUZ-GE24NA MUY-GE24NA** | 1.0 | 0.954 | 0.878 | 0.771 |

**3) HEATING CAPACITY (MUZ)**

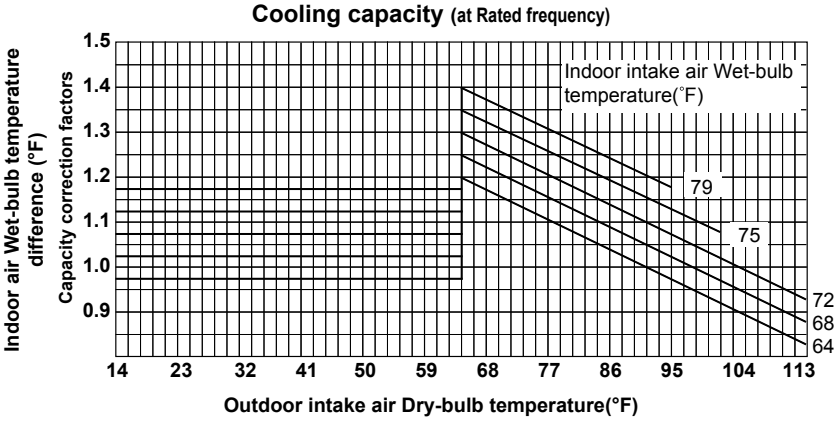
| Model | Indoor air IDB (˚F) | Outdoor intake air WB temperature (˚F) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5 | | 15 | | 25 | | 35 | | 43 | | 45 | | 55 | |
| | | TC | TPC | TC | TPC | TC | TPC | TC | TPC | TC | TPC | TC | TPC | TC | TPC |
| **MUZ-GE09NA** | 75 | 4.8 | 0.45 | 6.3 | 0.57 | 7.9 | 0.67 | 9.4 | 0.74 | 10.6 | 0.78 | 11.0 | 0.79 | 12.4 | 0.82 |
| | 70 | 5.2 | 0.43 | 6.7 | 0.55 | 8.2 | 0.65 | 9.6 | 0.72 | 10.9 | 0.76 | 11.2 | 0.78 | 12.7 | 0.81 |
| | 65 | 5.5 | 0.41 | 6.9 | 0.52 | 8.6 | 0.63 | 10.0 | 0.70 | 11.2 | 0.74 | 11.6 | 0.75 | 13.0 | 0.79 |
| **MUZ-GE12NA** | 75 | 6.3 | 0.69 | 8.4 | 0.87 | 10.4 | 1.02 | 12.5 | 1.14 | 14.0 | 1.20 | 14.5 | 1.22 | 16.4 | 1.26 |
| | 70 | 6.8 | 0.66 | 8.9 | 0.84 | 10.8 | 1.00 | 12.7 | 1.11 | 14.4 | 1.17 | 14.8 | 1.19 | 16.8 | 1.24 |
| | 65 | 7.2 | 0.63 | 9.1 | 0.81 | 11.3 | 0.97 | 13.2 | 1.08 | 14.8 | 1.14 | 15.3 | 1.16 | 17.1 | 1.22 |
| **MUZ-GE15NA** | 75 | 7.9 | 0.63 | 10.4 | 0.79 | 13.1 | 0.93 | 1.56 | 1.03 | 17.6 | 1.09 | 18.1 | 1.10 | 20.5 | 1.14 |
| | 70 | 8.6 | 0.60 | 11.1 | 0.76 | 13.5 | 0.91 | 15.9 | 1.01 | 18.0 | 1.06 | 18.5 | 1.08 | 21.0 | 1.12 |
| | 65 | 9.0 | 0.57 | 11.3 | 0.73 | 14.1 | 0.87 | 16.5 | 0.98 | 18.5 | 1.03 | 19.1 | 1.05 | 21.4 | 1.10 |
| **MUZ-GE18NA** | 75 | 9.1 | 0.64 | 11.9 | 0.81 | 14.9 | 0.95 | 17.8 | 1.06 | 20.1 | 1.12 | 20.7 | 1.13 | 23.5 | 1.18 |
| | 70 | 9.8 | 0.62 | 12.7 | 0.78 | 15.5 | 0.93 | 18.2 | 1.04 | 20.6 | 1.09 | 21.2 | 1.11 | 24.0 | 1.16 |
| | 65 | 10.3 | 0.59 | 13.0 | 0.75 | 16.2 | 0.90 | 18.8 | 1.01 | 21.2 | 1.06 | 21.8 | 1.08 | 24.5 | 1.13 |
| **MUZ-GE24NA** | 75 | 12.1 | 1.38 | 16.0 | 1.74 | 20.0 | 2.05 | 23.9 | 2.28 | 26.9 | 2.40 | 27.7 | 2.43 | 31.5 | 2.53 |
| | 70 | 13.1 | 1.32 | 17.0 | 1.68 | 20.7 | 2.00 | 24.4 | 2.22 | 27.6 | 2.34 | 28.4 | 2.39 | 32.2 | 2.48 |
| | 65 | 13.8 | 1.26 | 17.4 | 1.61 | 21.7 | 1.93 | 25.3 | 2.16 | 28.4 | 2.28 | 29.3 | 2.32 | 32.8 | 2.43 |

**NOTE**: 1. IDB: Intake air dry-bulb temperature
TC: Total Capacity (x10$^3$ Btu/h)
TPC: Total Power Consumption (kW)
2. Above data is for heating operation without any frost.

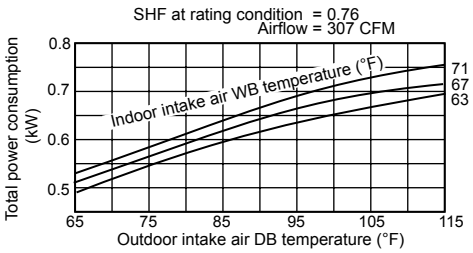
How to operate with fixed operational frequency of the compressor.
1. Press the EMERGENCY OPERATION switch on the front of the indoor unit, and select either EMERGENCY COOL mode or EMERGENCY HEAT mode before starting to operate the air conditioner.
2. The compressor starts with operational frequency.
3. The fan speed of the indoor unit is High.
4. This operation continues for 30 minutes.
5. In order to release this operation, press the EMERGENCY OPERATION switch twice or once, or press any button on the remote controller.

## 7-2. PERFORMANCE CURVE

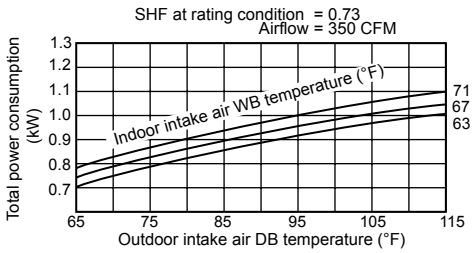
### Cooling



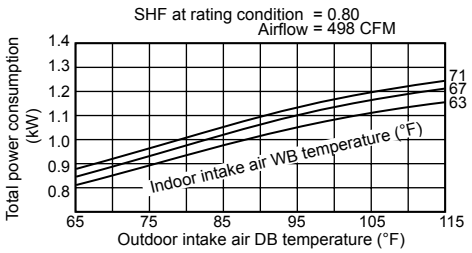

**MUZ-GE09NA**
**MUY-GE09NA**



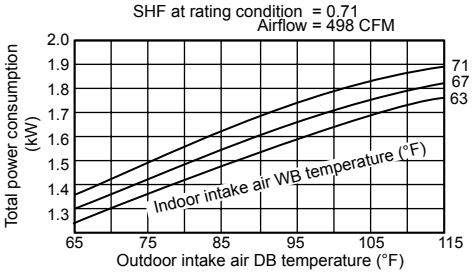

**MUZ-GE12NA**
**MUY-GE12NA**



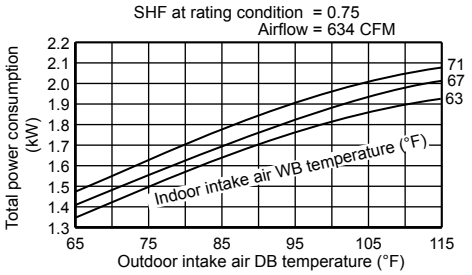
**MUZ-GE15NA**
**MUY-GE15NA**



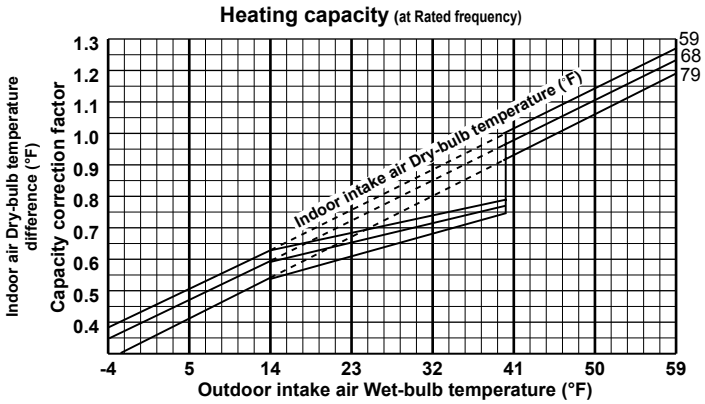

**MUZ-GE18NA**
**MUY-GE18NA**



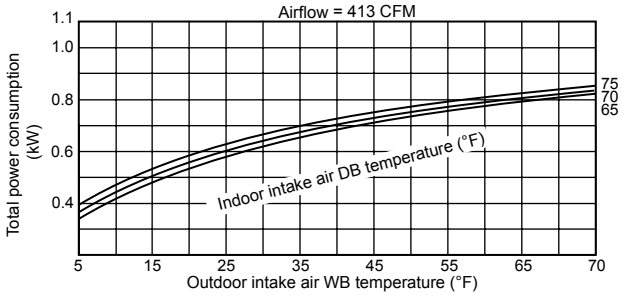

**MUZ-GE24NA**
**MUY-GE24NA**



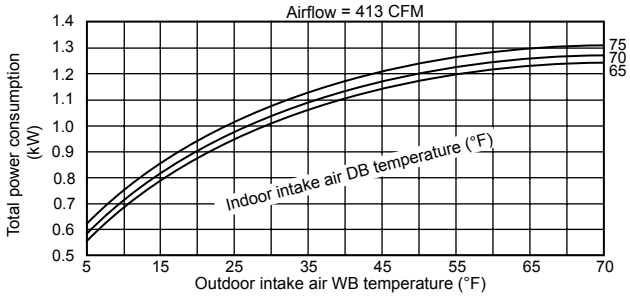

## Heating (MUZ)



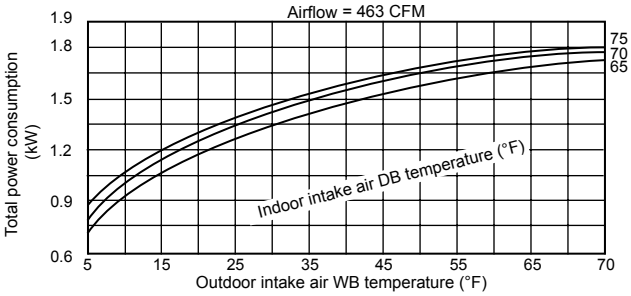

**MUZ-GE09NA**




**MUZ-GE12NA**

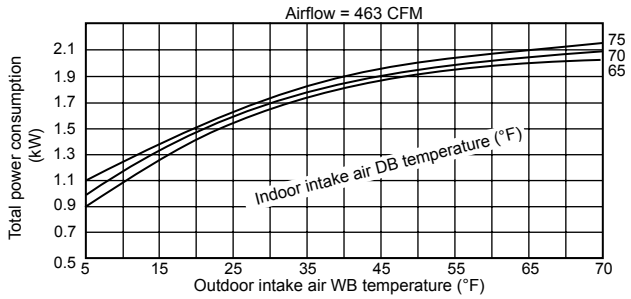



**MUZ-GE15NA**

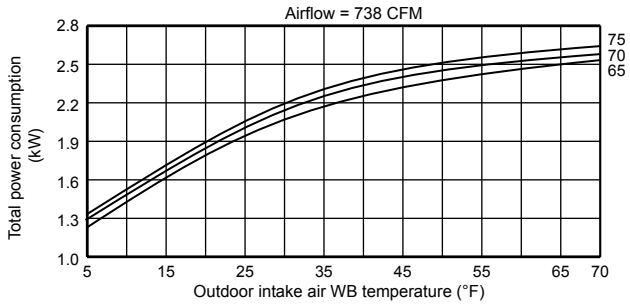



This value of frequency is not the same as the actual frequency in operating. Refer to 7-5 and 7-6 for the relationships between frequency and capacity.

**MUZ-GE18NA**




**MUZ-GE24NA**



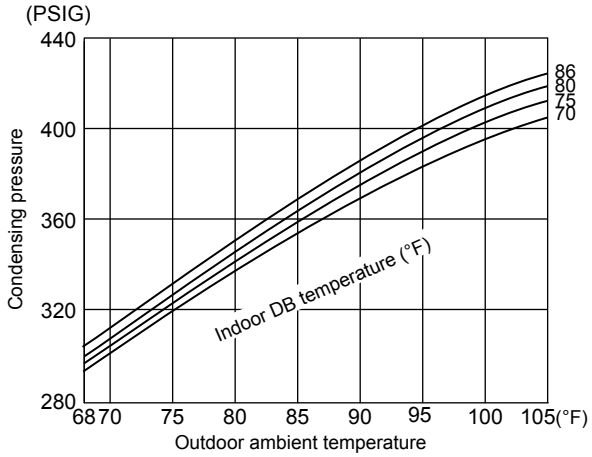

This value of frequency is not the same as the actual frequency in operating. Refer to 7-5 and 7-6 for the relationships between frequency and capacity.

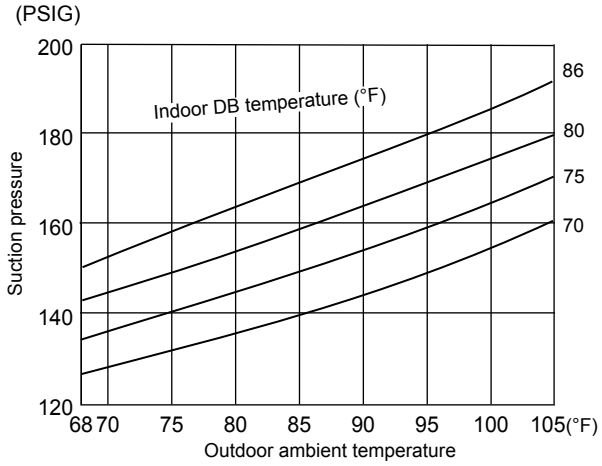
## 7-3. CONDENSING PRESSURE

### Cooling

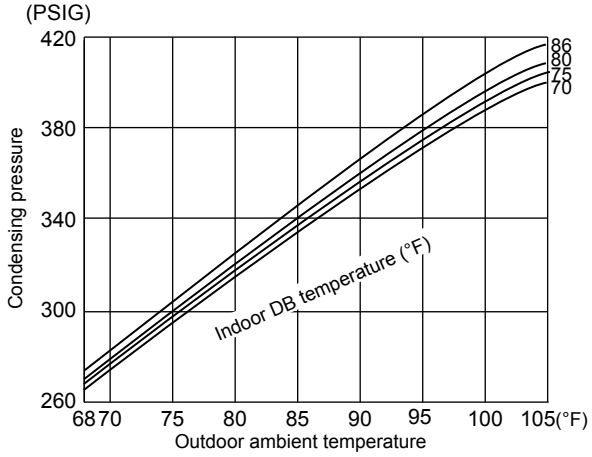
Data is based on the condition of indoor humidity 50 %.
Air flow should be set to High speed.

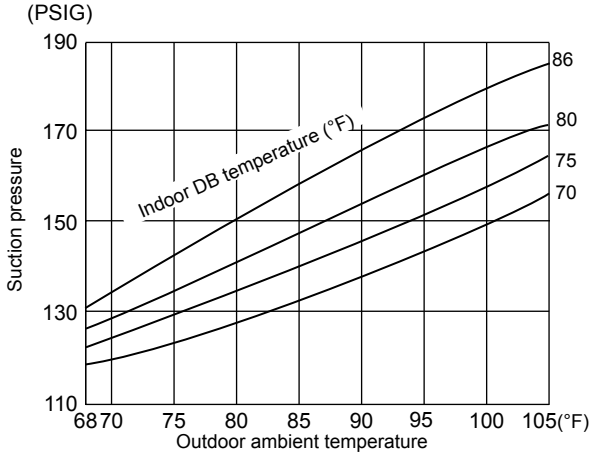
**MUZ-GE09NA MUY-GE09NA**



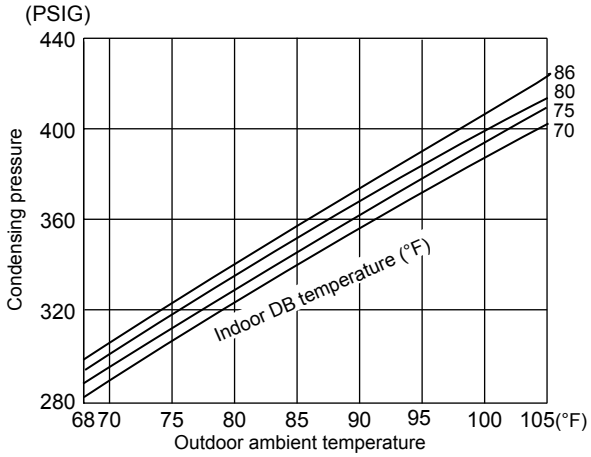



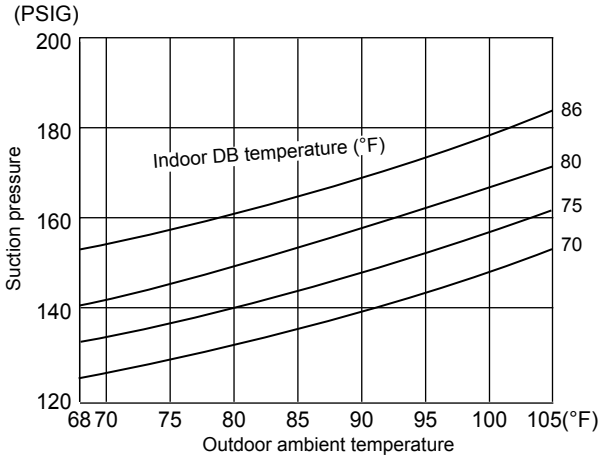

**MUZ-GE12NA MUY-GE12NA**



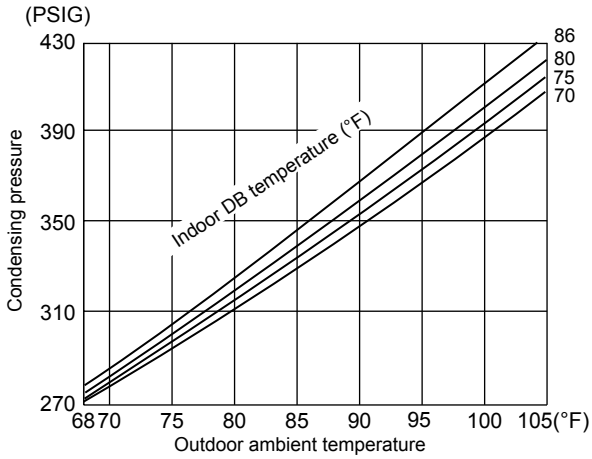



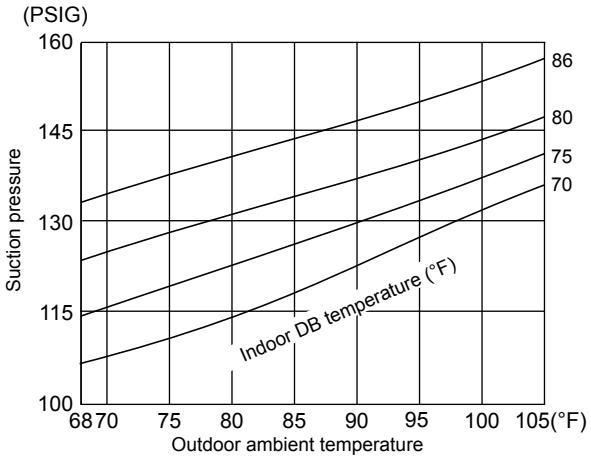
## MUZ-GE15NA MUY-GE15NA



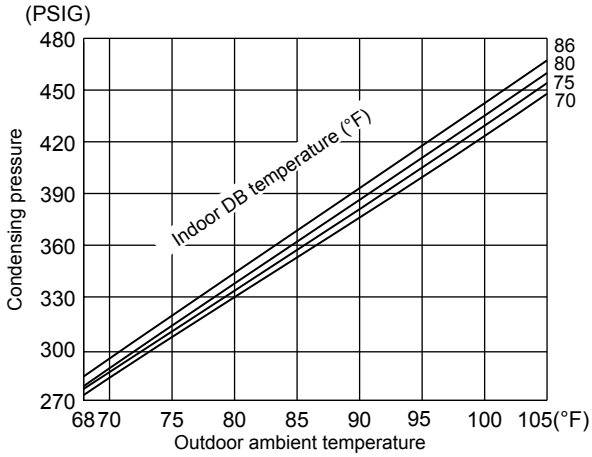



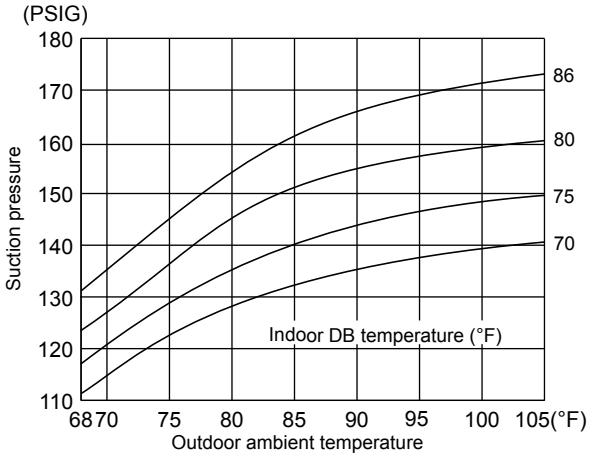

## MUZ-GE18NA MUY-GE18NA



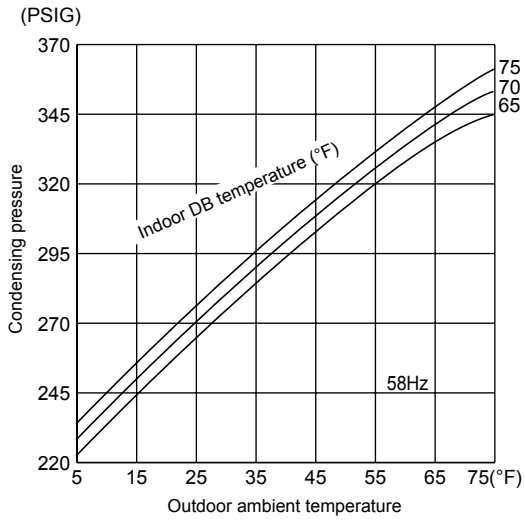

## MUZ-GE24NA MUY-GE24NA

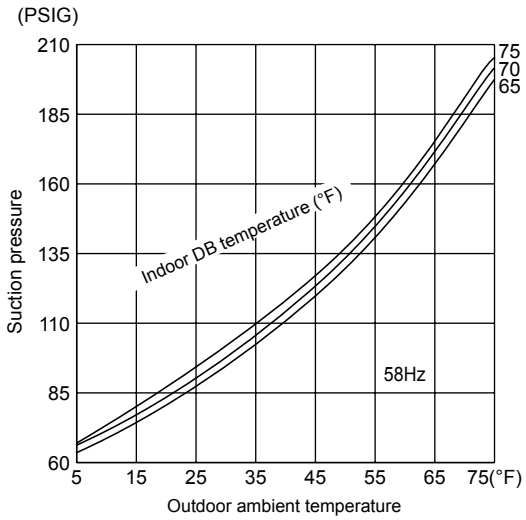


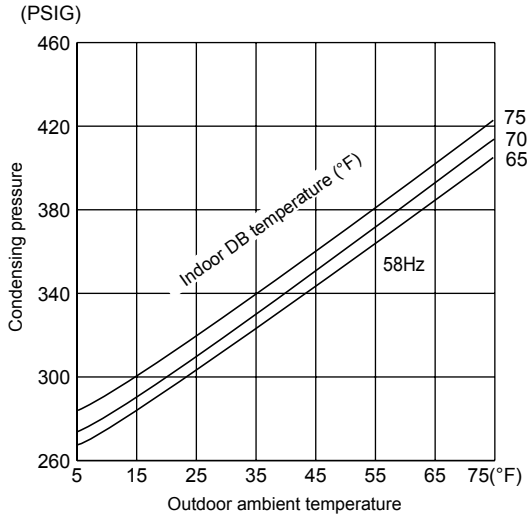
**Heating (MUZ)**
Data is based on the condition of outdoor humidity 75%.
Air flow should be set to High speed.
Data is for heating operation without any frost.

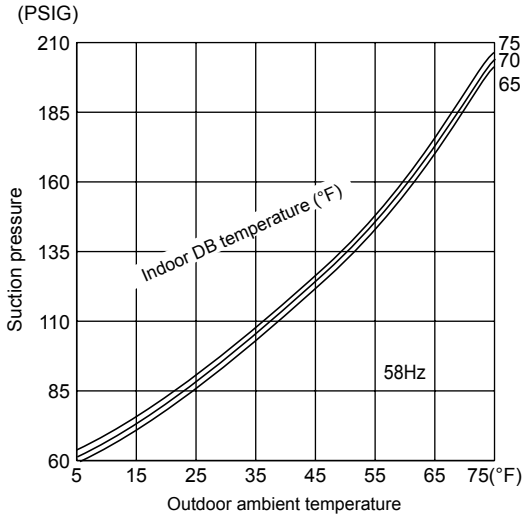
**MUZ-GE09NA**



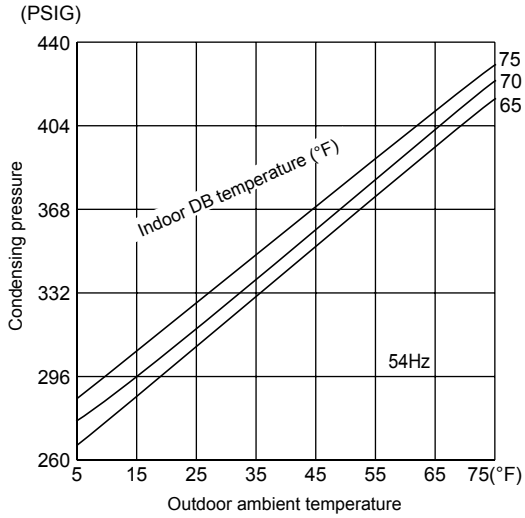



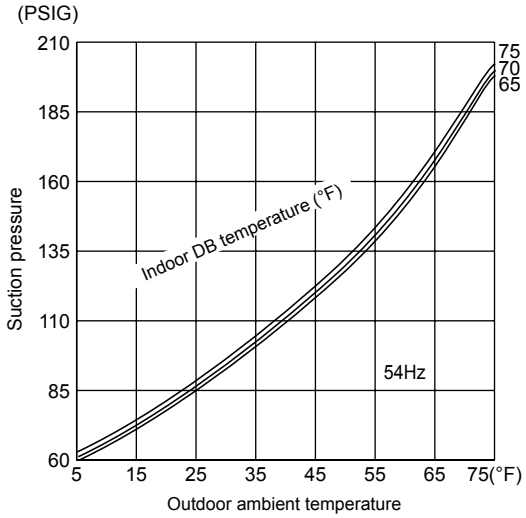

**MUZ-GE12NA**



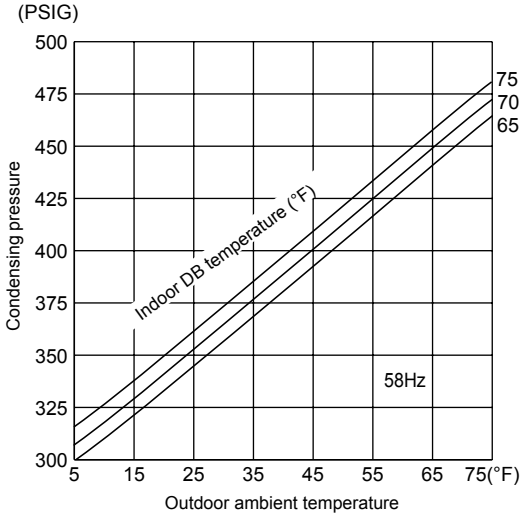



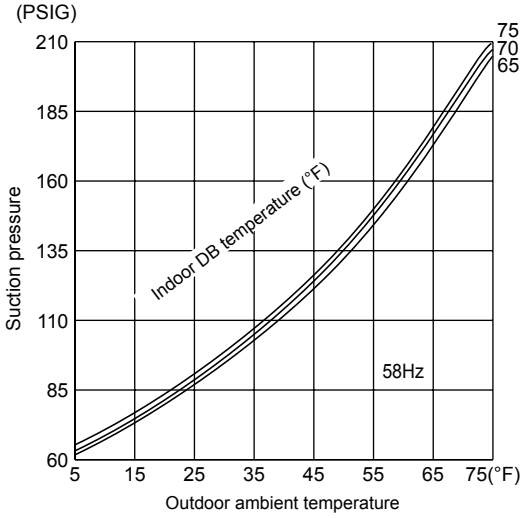

**MUZ-GE15NA**



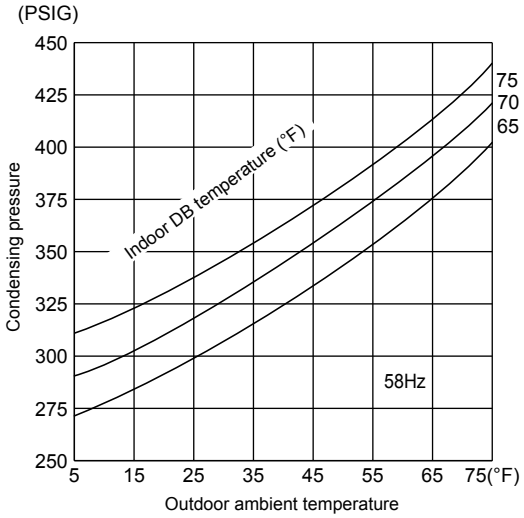



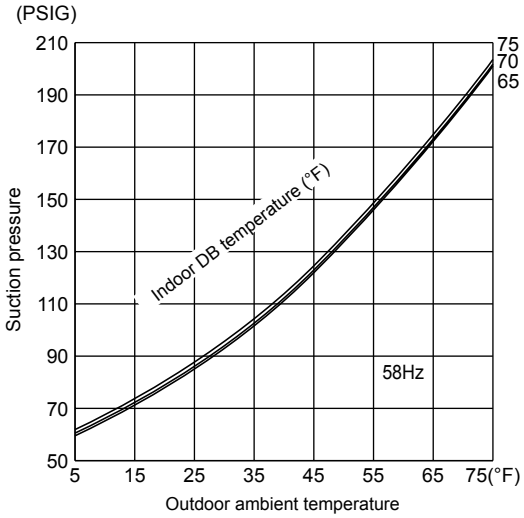
## MUZ-GE18NA




## MUZ-GE24NA



## 7-4. STANDARD OPERATION DATA

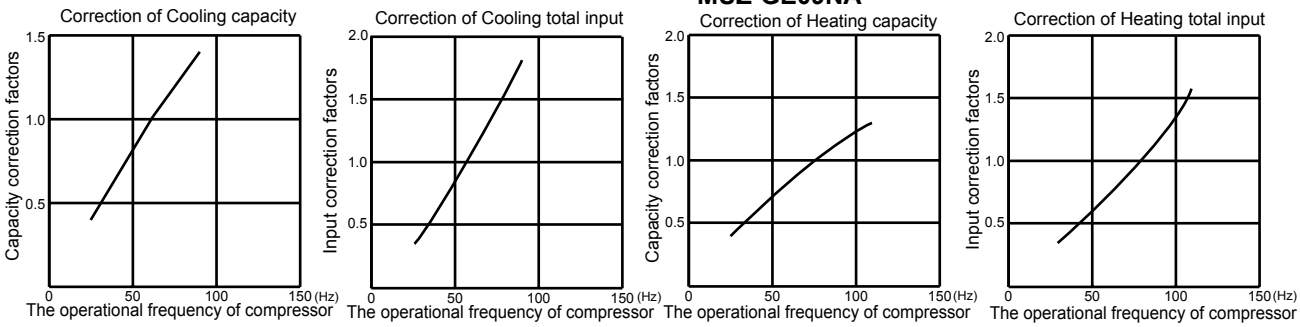
| Model | | | | MSZ-GE09NA MSY-GE09NA | MSZ-GE09NA | MSZ-GE12NA MSY-GE12NA | MSZ-GE12NA |
|---|---|---|---|---|---|---|---|
| Item | | | Unit | Cooling | Heating | Cooling | Heating |
| Total | Capacity | | Btu/h | 9,000 | 10,900 | 12,000 | 14,400 |
| | SHF | | - | 0.82 | — | 0.74 | — |
| | Input | | kW | 0.660 | 0.760 | 0.960 | 1.170 |
| | Rated frequency | | Hz | 59.5 | 77.5 | 69.0 | 77.0 |
| Electrical circuit | Indoor unit | | | **MSZ-GE09NA, MSY-GE09NA** | | **MSZ-GE12NA, MSY-GE12NA** | |
| | Power supply (V, Phase, Hz) | | | 208 / 230, 1, 60 | | | |
| | Input | | kW | 0.022 | 0.023 | 0.022 | 0.023 |
| | Fan motor current | | A | 0.24/0.22 | 0.25/0.23 | 0.24/0.22 | 0.25/0.23 |
| | Outdoor unit | | | **MUZ-GE09NA MUY-GE09NA** | **MUZ-GE09NA** | **MUZ-GE12NA MUY-GE12NA** | **MUZ-GE12NA** |
| | Power supply (V, phase, Hz) | | | 208/230, 1, 60 | | | |
| | Input | | kW | 0.638 | 0.737 | 0.938 | 1.147 |
| | Comp. current | | A | 3.32/3.00 | 3.66/3.31 | 4.39/3.97 | 5.41/4.89 |
| | Fan motor current | | A | 0.27/0.24 | 0.30/0.27 | 0.34/0.31 | 0.31/0.28 |
| Refrigerant circuit | Condensing pressure | | PSIG | 389 | 331 | 389 | 397 |
| | Suction pressure | | PSIG | 151 | 103 | 133 | 104 |
| | Discharge temperature | | °F | 154 | 152 | 163 | 162 |
| | Condensing temperature | | °F | 115 | 103 | 115 | 116 |
| | Suction temperature | | °F | 59 | 39 | 56 | 35 |
| | Comp. shell bottom temp | | °F | 151 | 149 | 158 | 158 |
| | Ref. pipe length | | ft. | 25 | | | |
| | Refrigerant charge (R410A) | | - | 1 lb. 12 oz. | | 2 lb. 9 oz. | |
| Indoor unit | Intake air temperature | DB | °F | 80 | 70 | 80 | 70 |
| | | WB | °F | 67 | 60 | 67 | 60 |
| | Discharge air temperature | DB | °F | 60 | 97 | 56 | 108 |
| | | WB | °F | 58 | — | 55 | — |
| | Fan speed (High) | | rpm | 1,020 | 1,040 | 1,020 | 1,040 |
| | Airflow (High) | | CFM | 367 (Wet) | 413 | 367 (Wet) | 413 |
| Outdoor unit | Intake air temperature | DB | °F | 95 | 47 | 95 | 47 |
| | | WB | °F | — | 43 | — | 43 |
| | Fan speed | | rpm | 800 | 850 | 900 | 860 |
| | Airflow | | CFM | 1151 | 1225 | 1229 | 1172 |

| Model | | | | MSZ-GE15NA MSY-GE15NA | MSZ-GE15NA | MSZ-GE18NA MSY-GE18NA | MSZ-GE18NA |
|---|---|---|---|---|---|---|---|
| Item | | | Unit | Cooling | Heating | Cooling | Heating |
| Total | Capacity | | Btu/h | 14,000 | 18,000 | 17,200 | 21,600 |
| | SHF | | - | 0.80 | — | 0.71 | — |
| | Input | | kW | 1.080 | 1.600 | 1.640 | 1.900 |
| | Rated frequency | | Hz | 55.5 | 74.0 | 83.0 | 84.0 |
| Electrical circuit | Indoor unit | | | **MSZ-GE15NA, MSY-GE15NA** | | **MSZ-GE18NA, MSY-GE18NA** | |
| | Power supply (V, Phase, Hz) | | | 208/230, 1, 60 | | | |
| | Input | | kW | 0.045 | 0.031 | 0.043 | 0.037 |
| | Fan motor current | | A | 0.50/0.45 | 0.35/0.32 | 0.43/0.39 | 0.40/0.36 |
| | Outdoor unit | | | **MUZ-GE15NA MUY-GE15NA** | **MUZ-GE15NA** | **MUZ-GE18NA MUY-GE18NA** | **MUZ-GE18NA** |
| | Power supply (V, phase, Hz) | | | 208/ 230, 1, 60 | | | |
| | Input | | kW | 1,035 | 1,569 | 1,595 | 1,860 |
| | Comp. current | | A | 4.86/4.40 | 7.38/6.67 | 6.97/6.29 | 8.36/7.55 |
| | Fan motor current | | A | 0.33/0.30 | 0.34/0.31 | 0.80/0.72 | 0.64/0.59 |
| Refrigerant circuit | Condensing pressure | | PSIG | 400 | 431 | 376 | 458 |
| | Suction pressure | | PSIG | 139 | 99 | 117 | 102 |
| | Discharge temperature | | °F | 164 | 179 | 177 | 184 |
| | Condensing temperature | | °F | 117 | 122 | 112 | 127 |
| | Suction temperature | | °F | 57 | 31 | 59 | 33 |
| | Comp. shell bottom temp | | °F | 148 | 165 | 164 | 170 |
| | Ref. pipe length | | ft. | 25 | | | |
| | Refrigerant charge (R410A) | | - | 2 lb. 9 oz. | | 3 lb. 7 oz. | |
| Indoor unit | Intake air temperature | DB | °F | 80 | 70 | 80 | 70 |
| | | WB | °F | 67 | 60 | 67 | 60 |
| | Discharge air temperature | DB | °F | 60 | 114 | 56 | 117 |
| | | WB | °F | 57 | — | 54 | — |
| | Fan speed (High) | | rpm | 1,280 | 1,140 | 1,280 | 1,240 |
| | Airflow (High) | | CFM | 498 (Wet) | 463 | 498 (Wet) | 512 |
| Outdoor unit | Intake air temperature | DB | °F | 95 | 47 | 95 | 47 |
| | | WB | °F | — | 43 | — | 43 |
| | Fan speed | | rpm | 910 | 900 | 780 | 740 |
| | Airflow | | CFM | 1,243 | 1,229 | 1,730 | 1,659 |

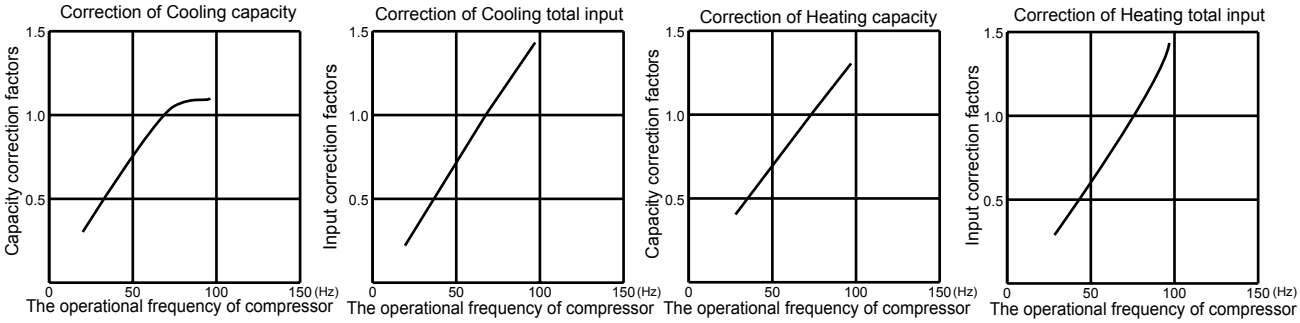
| Model | | | | MSZ-GE24NA<br>MSY-GE24NA | MSZ-GE24NA |
|---|---|---|---|---|---|
| Item | | | Unit | Cooling | Heating |
| Total | Capacity | | Btu/h | 22,500 | 27,600 |
| | SHF | | - | 0.75 | — |
| | Input | | kW | 1.800 | 2.340 |
| | Rated frequency | | Hz | 66.5 | 82.0 |
| Electrical circuit | Indoor unit | | | **MSZ-GE24NA, MSY-GE24NA** | |
| | Power supply (V, Phase, Hz) | | | 208/230, 1, 60 | |
| | Input | | kW | 0.058 | |
| | Fan motor current | | A | 0.56/0.51 | |
| | Outdoor unit | | | **MUZ-GE24NA<br>MUY-GE24NA** | **MUZ-GE24NA** |
| | Power supply (V, phase, Hz) | | | 208/230, 1, 60 | |
| | Input | | kW | 1.742 | 2.282 |
| | Comp. current | | A | 7.01/6.34 | 9.59/8.67 |
| | Fan motor current | | A | 1.61/1.05 | 1.13/1.02 |
| Refrigerant circuit | Condensing pressure | | PSIG | 395 | 405 |
| | Suction pressure | | PSIG | 141 | 102 |
| | Discharge temperature | | °F | 158 | 171 |
| | Condensing temperature | | °F | 115 | |
| | Suction temperature | | °F | 52 | 33 |
| | Comp. shell bottom temp | | °F | 140 | 148 |
| | Ref. pipe length | | ft. | 25 | |
| | Refrigerant charge (R410A) | | - | 4 lb. 3 oz. | |
| Indoor unit | Intake air temperature | DB | °F | 80 | 70 |
| | | WB | °F | 67 | 60 |
| | Discharge air temperature | DB | °F | 56 | 111 |
| | | WB | °F | 53 | — |
| | Fan speed (High) | | rpm | 1,300 | |
| | Airflow (High) | | CFM | 634 (Wet) | 738 |
| Outdoor unit | Intake air temperature | DB | °F | 95 | 47 |
| | | WB | °F | — | 43 |
| | Fan speed | | rpm | 840 | 810 |
| | Airflow | | CFM | 1,769 | 1,701 |

## 7-5. CAPACITY AND INPUT CORRECTION BY INVERTER OUTPUT FREQUENCY

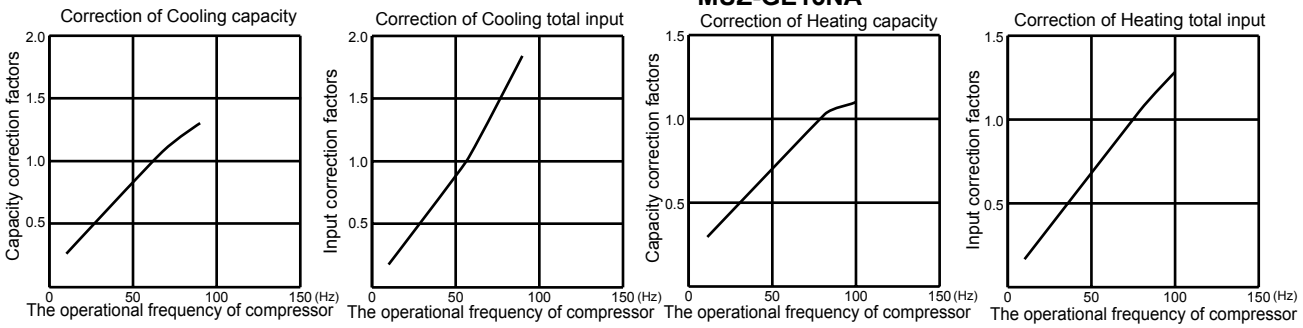
### MUZ-GE09NA
### MUY-GE09NA



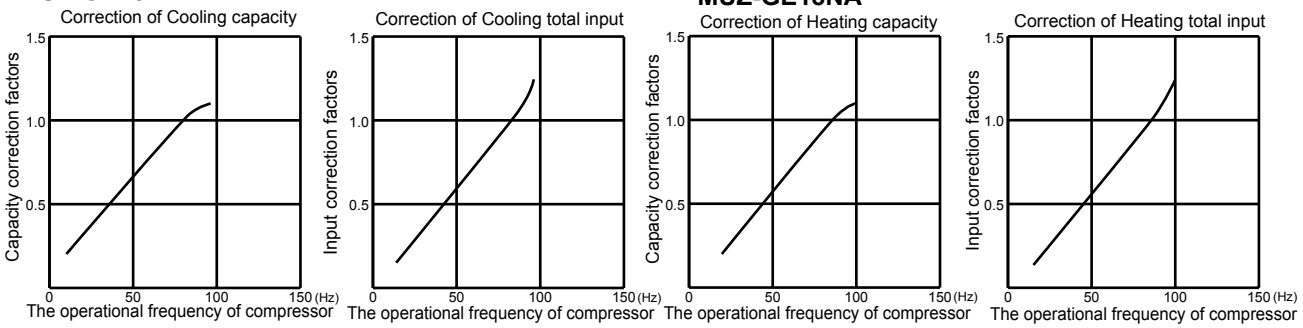

### MUZ-GE12NA
### MUY-GE12NA



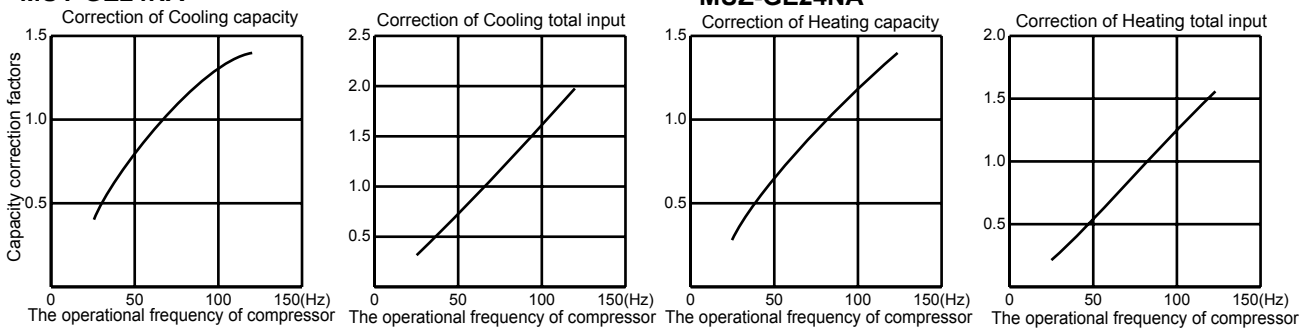

### MUZ-GE15NA
### MUY-GE15NA




### MUZ-GE18NA
### MUY-GE18NA



**MUZ-GE24NA**
**MUY-GE24NA**




**MUZ-GE24NA**




## 7-6. HOW TO OPERATE FIXED-FREQUENCY OPERATION (Test run operation)

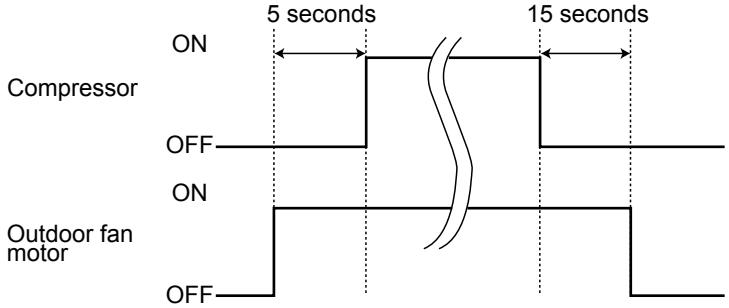
1. Press EMERGENCY OPERATION switch to start COOL or HEAT mode (COOL: Press once, HEAT: Press twice).
2. Test run operation starts and continues to operate for 30 minutes.
3. Compressor operates at rated frequency in COOL mode or 58 Hz in HEAT mode.
4. Indoor fan operates at High speed.
5. After 30 minutes, test run operation finishes and EMERGENCY OPERATION starts (operation frequency of compressor varies).
6. To cancel test run operation (EMERGENCY OPERATION), press EMERGENCY OPERATION switch or any button on remote controller.

# 8 ACTUATOR CONTROL

## MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA MUZ-GE18NA MUZ-GE24NA
## MUY-GE09NA MUY-GE12NA MUY-GE15NA MUY-GE18NA MUY-GE24NA

### 8-1. OUTDOOR FAN MOTOR CONTROL

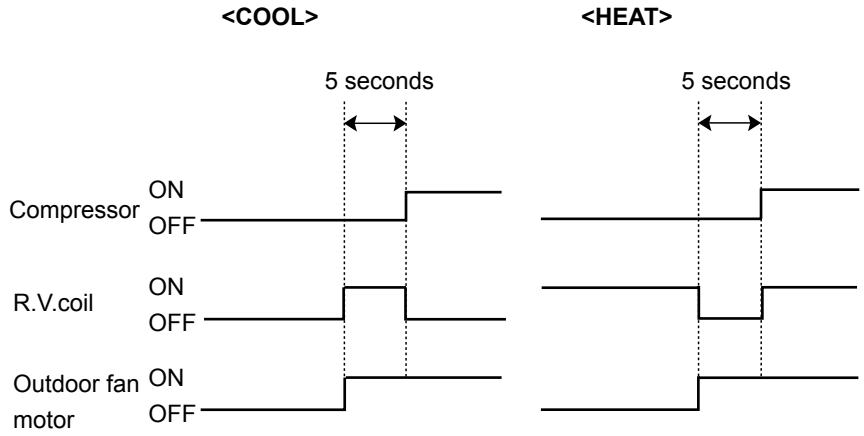
The fan motor turns ON/OFF, interlocking with the compressor.
[ON] The fan motor turns ON 5 seconds before the compressor starts up.
[OFF] The fan motor turns OFF 15 seconds after the compressor has stopped running.




### 8-2. R.V. COIL CONTROL (MUZ)

Heating · · · · · · · · · · · · · · · · · ON
Cooling · · · · · · · · · · · · · · · · · OFF
Dry · · · · · · · · · · · · · · · · · · · OFF

**NOTE**: The 4-way valve reverses for 5 seconds right before start-up of the compressor.




### 8-3. RELATION BETWEEN MAIN SENSOR AND ACTUATOR

| Sensor | Purpose | Actuator | | | | |
|---|---|---|---|---|---|---|
| | | Compressor | LEV | Outdoor fan motor | R.V.coil **(MUZ)** | Indoor fan motor |
| Discharge temperature thermistor | Protection | ○ | ○ | | | |
| Indoor coil temperature thermistor | Cooling: Coil frost prevention | ○ | | | | |
| | Heating: High pressure protection | ○ | ○ | | | |
| Defrost thermistor **(MUZ)** | Heating: Defrosting | ○ | ○ | ○ | ○ | ○ |
| Fin temperature thermistor | Protection | ○ | | ○ | | |
| Ambient temperature thermistor | Cooling: Low ambient temperature operation | ○ | ○ | ○ | | |
| Outdoor heat exchanger temperature thermistor | Cooling: Low ambient temperature operation | ○ | ○ | ○ | | |
| | Cooling: High pressure protection | ○ | ○ | ○ | | |

# 9 SERVICE FUNCTIONS

## MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA MUZ-GE18NA MUZ-GE24NA
## MUY-GE09NA MUY-GE12NA MUY-GE15NA MUY-GE18NA MUY-GE24NA

### 9-1. CHANGE IN DEFROST SETTING (MUZ)

**Changing defrost finish temperature**

<JS> To change the defrost finish temperature, cut/solder the JS wire of the outdoor inverter P.C. board. (Refer to 10-6.1.)

| Jumper | | Defrost finish temperature | | | | |
|---|---|---|---|---|---|---|
| | | MUZ-GE09 | MUZ-GE12 | MUZ-GE15 | MUZ-GE18 | MUZ-GE18/24 |
| JS | Soldered (Initial setting) | 41°F (5°C) | 50°F (10°C) | 41°F (5°C) | 48°F (9°C) | 50°F (10°C) |
| | None (Cut) | 46°F (8°C) | 55°F (13°C) | 50°F (10°C) | 64°F (18°C) | 64°F (18°C) |

### 9-2. PRE-HEAT CONTROL SETTING

**PRE-HEAT CONTROL**

When moisture gets into the refrigerant cycle, it may interfere the start-up of the compressor at low outside temperature. The pre-heat control prevents this interference. The pre-heat control turns ON when outside temperature is 68°F (20 °C) or below. When pre-heat control is turned ON, compressor is energized. (About 50 W)

<JK> To activate the pre-heat control, cut the JK wire of the inverter P.C. board. (Refer to 10-6.1.)

**NOTE:** When the inverter P.C. board is replaced, check the Jumper wires, and cut/solder them if necessary.

# 10 TROUBLESHOOTING

## MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA MUZ-GE18NA MUZ-GE24NA
## MUY-GE09NA MUY-GE12NA MUY-GE15NA MUY-GE18NA MUY-GE24NA

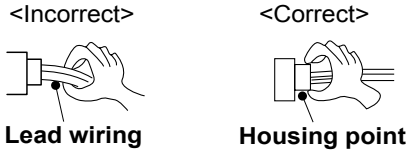
### 10-1. CAUTIONS ON TROUBLESHOOTING

**1. Before troubleshooting, check the following**

1) Check the power supply voltage.
2) Check the indoor/outdoor connecting wire for miswiring.

**2. Take care of the following during servicing**

1) Before servicing the air conditioner, be sure to turn OFF the main unit first with the remote controller, then after confirming the horizontal vane is closed, turn off the breaker and/or disconnect the power plug.
2) Be sure to turn OFF the power supply before removing the front panel, the cabinet, the top panel, and the electronic control P.C. board.
3) When removing the electrical parts, be careful of the residual voltage of smoothing capacitor.
4) When removing the electronic control P.C. board, hold the edge of the board with care NOT to apply stress on the components.
5) When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.




**3. Troubleshooting procedure**

1) First, check if the OPERATION INDICATOR lamp on the indoor unit is flashing ON and OFF to indicate an abnormality. To make sure, check how many times the OPERATION INDICATOR lamp is flashing ON and OFF before starting service work.
2) Before servicing, check that the connector and terminal are connected properly.
3) When the electronic control P.C. board seems to be defective, check the copper foil pattern for disconnection and the components for bursting and discoloration.
4) Refer to 10-2. and 10-3.

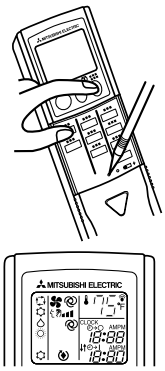
## 10-2. FAILURE MODE RECALL FUNCTION

Outline of the function

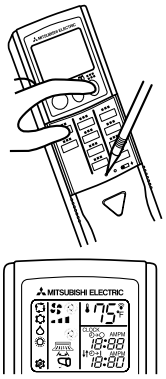
This air conditioner can memorize the abnormal condition which has occurred once.
Even though LED indication listed on the troubleshooting check table (10-3.) disappears, the memorized failure details can be recalled.

### 1. Flow chart of failure mode recall function for the indoor/outdoor unit

**MSZ-GE06/09/12/15/18NA**
**MSY-GE09/12/15/18NA**



**MSZ-GE24NA**
**MSY-GE24NA**



Operational procedure

The cause of abnormality cannot be found because the abnormality does not recur.

Setting up the failure mode recall function

Turn ON the power supply.
<Preparation of the remote controller>
① While pressing both OPERATION SELECT button and TOO COOL button on the remote controller at the same time, press RESET button.
② First, release RESET button.
And release the other two buttons after all LCD in operation display section of the remote controller is displayed after 3 seconds.

Press OPERATE/STOP (ON/OFF) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit. ※1

※1. Regardless of normal or abnormal condition, a short beep is emitted once the signal is received.

Does the upper lamp of OPERATION INDICATOR lamp on the indoor unit blink at the interval of 0.5 seconds?
Blinks: Either indoor or outdoor unit is abnormal. Beep is emitted at the same timing as the blinking of the upper lamp of OPERATION INDICATOR lamp. ※2

No (OFF) → Indoor unit is normal.
But the outdoor unit might be abnormal because there are some abnormalities that can not be recalled with this way.
Confirm if outdoor unit is abnormal according to the detailed outdoor unit failure mode recall function. (Refer to 10-2.2)

Yes (Blinks)

Judgment of indoor/outdoor abnormality

Before blinking, does the upper lamp of OPERATION INDICATOR lamp stay ON for 3 seconds?
Stays ON for 3 seconds (without beep): The outdoor unit is abnormal.

Yes → The outdoor unit is abnormal.
Check the blinking pattern, and confirm the abnormal point with the outdoor unit failure mode table. (Refer to 10-2.3)
Make sure to check at least two consecutive blinking cycles. ※3

No → The indoor unit is abnormal.
Check the blinking pattern, and confirm the abnormal point with the indoor unit failure mode table. (Refer to indoor unit service manual.)
Make sure to check at least two consecutive blinking cycles. ※2

Releasing the failure mode recall function

Release the failure mode recall function by the following procedures.
Turn OFF the power supply and turn it ON again.
Press RESET button of the remote controller.

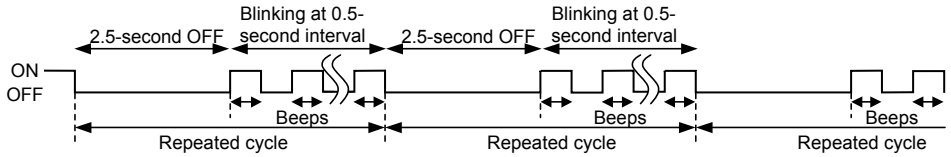
Repair the defective parts.

Deleting the memorized abnormal condition

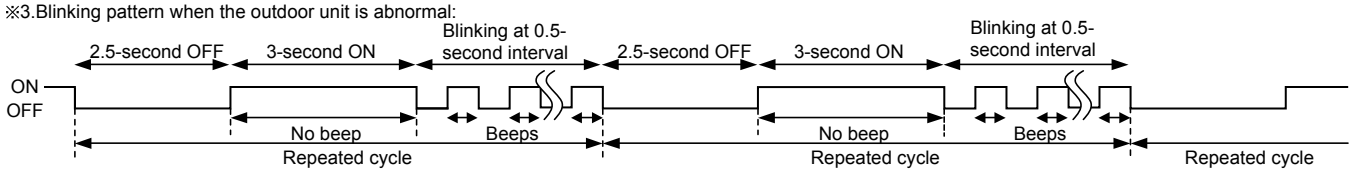
① After repairing the unit, recall the failure mode again according to "Setting up the failure mode recall function" mentioned above.
② Press OPERATE/STOP (ON/OFF) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit.
③ Press EMERGENCY OPERATION switch so that the memorized abnormal condition is deleted.
④ Release the failure mode recall function according to "Releasing the failure mode recall function" mentioned above.

**NOTE:** 1. Make sure to release the failure mode recall function once it is set up, otherwise the unit cannot operate properly.
2. If the abnormal condition is not deleted from the memory, the last abnormal condition is kept memorized.

※2. Blinking pattern when the indoor unit is abnormal:




※3.Blinking pattern when the outdoor unit is abnormal:



## 2. Flow chart of the detailed outdoor unit failure mode recall function

Operational procedure

The outdoor unit might be abnormal.
Confirm if outdoor unit is abnormal according to the following procedures.

↓

Confirm that the remote controller is in the failure mode recall function.

↓

With the remote controller headed towards the indoor unit, press TOO COOL or TOO WARM button to adjust the set temperature to 77°F (25°C). ※1

※1. Regardless of normal or abnormal condition, 2 short beeps are emitted as the signal is received.

↓

Does the upper lamp of OPERATION INDICATOR lamp on the indoor unit blink at the interval of 0.5 seconds?
Blinks: The outdoor unit is abnormal. Beep is emitted at the same timing as the blinking of the upper lamp of OPERATION INDICATOR lamp. ※2

No (OFF) → The outdoor unit is normal.

Yes (Blinks)

↓

The outdoor unit is abnormal.
Check the blinking pattern, and confirm the abnormal point with the outdoor unit failure mode table (10-2.3.).
Make sure to check at least two consecutive blinking cycles. ※2

Releasing the failure mode recall function

↓

Release the failure mode recall function by the following procedures.
Turn OFF the power supply and turn it ON again.
Press RESET button of the remote controller.

Release the failure mode recall function according to the left mentioned procedure.

↓

Repair the defective parts.

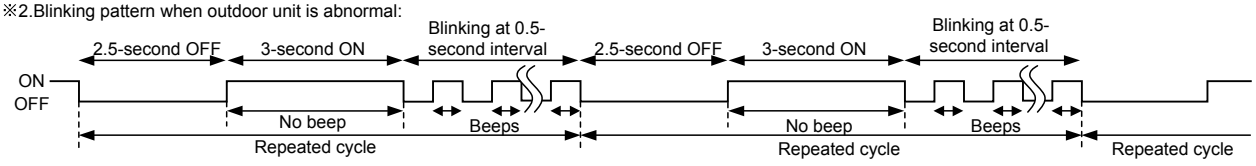
↓

Deleting the memorized abnormal condition

① After repairing the unit, recall the failure mode again according to "Setting up the failure mode recall function" (10-2.1.).
② Press OPERATE/STOP (ON/OFF) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit.
③ Press EMERGENCY OPERATION switch so that the memorized abnormal condition is deleted.
④ Release the failure mode recall function according to "Releasing the failure mode recall function" mentioned above.

**NOTE**: 1. Make sure to release the failure mode recall function once it is set up, otherwise the unit cannot operate properly.
2. If the abnormal condition is not deleted from the memory, the last abnormal condition is kept memorized.

※2.Blinking pattern when outdoor unit is abnormal:



### 3. Outdoor unit failure mode table

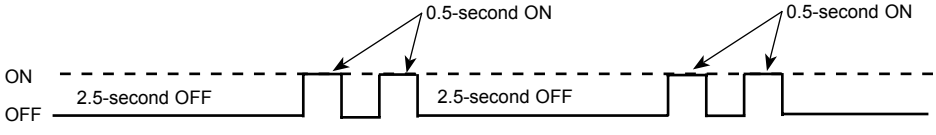
| OPERATION INDICATOR upper lamp (Indoor unit) | Abnormal point (Failure mode / protection) | LED indication (Outdoor P.C. board) | Condition | Remedy | Indoor/ outdoor unit failure mode recall function | Outdoor unit failure mode recall function |
|---|---|---|---|---|---|---|
| OFF | None (Normal) | — | — | — | — | — |
| 2-time flash 2.5 seconds OFF | Outdoor power system | — | Overcurrent protection stop is continuously performed 3 times within 1 minute after the compressor gets started. | •Reconnect connectors.<br>•Refer to 10-5. Ⓐ"How to check inverter/ compressor".<br>•Check stop valve. | ○ | ○ |
| 3-time flash 2.5 seconds OFF | Discharge temperature thermistor | 1-time flash every 2.5 seconds | Thermistor shorts or opens during compressor running. | •Refer to 10-5.Ⓖ"Check of outdoor thermistors". Defective outdoor thermistors can be identified by checking the blinking pattern of LED. | ○ | ○ |
| | Defrost thermistor **(MUZ)** | | | | | |
| | Fin temperature thermistor | 3-time flash 2.5 seconds OFF | | | | |
| | P.C. board temperature thermistor | 4-time flash 2.5 seconds OFF | | | | |
| | Ambient temperature thermistor | 2-time flash 2.5 seconds OFF | | | | |
| | Outdoor heat exchanger temperature thermistor **(MUZ/MUY-GE24NA)** | | | | | |
| 4-time flash 2.5 seconds OFF | Overcurrent | 11-time flash 2.5 seconds OFF | Large current flows into intelligent power module. | •Reconnect compressor connector.<br>•Refer to 10-5.Ⓐ"How to check inverter/ compressor".<br>•Check stop valve. | — | ○ |
| | Compressor synchronous abnormality (Compressor start-up failure protection) | 12-time flash 2.5 seconds OFF | Waveform of compressor current is distorted. | •Reconnect compressor connector.<br>•Refer to 10-5.Ⓐ"How to check inverter/ compressor". | — | ○ |
| 5-time flash 2.5 seconds OFF | Discharge temperature | — | Temperature of discharge temperature thermistor exceeds 241°F (116°C), compressor stops. Compressor can restart if discharge temperature thermistor reads 212°F (100°C) or less 3 minutes later. | •Check refrigerant circuit and refrigerant amount.<br>•Refer to 10-5.Ⓚ"Check of LEV". | — | ○ |
| 6-time flash 2.5 seconds OFF | High pressure | — | Temperature of indoor coil thermistor exceeds 158°F (70°C) in HEAT mode **(MUZ only).** Temperature of outdoor heat exchanger temperature thermistor exceeds 158°F (70°C) in COOL mode. | •Check refrigerant circuit and refrigerant amount.<br>•Check stop valve. | — | ○ |
| 7-time flash 2.5 seconds OFF | Fin temperature/ P.C. board temperature | 7-time flash 2.5 seconds OFF | Temperature of fin temperature thermistor on the inverter P.C. board exceeds 167 ~ 176°F (75 ~ 80°C), or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 158 ~ 167°F (70 ~ 75°C). | •Check around outdoor unit.<br>•Check outdoor unit air passage.<br>•Refer to 10-5.Ⓘ"Check of outdoor fan motor". | — | ○ |
| 8-time flash 2.5 seconds OFF | Outdoor fan motor | — | Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up. | •Refer to 10-5.Ⓘ"Check of outdoor fan motor". Refer to 10-5.Ⓛ"Check of inverter P.C. board". | — | ○ |
| 9-time flash 2.5 seconds OFF | Nonvolatile memory data | 5-time flash 2.5 seconds OFF | Nonvolatile memory data cannot be read properly. | •Replace the inverter P.C. board. | ○ | ○ |
| | Power module **(MUZ/MUY-GE24NA)** | 6-time flash 2.5 seconds OFF | The interphase short circuit occurs in the output of the intelligent power module (IPM). The compressor winding shorts circuit. | •Refer to 10-5.Ⓐ"How to check inverter/ compressor". | | |
| 10-time flash 2.5 seconds OFF | Discharge temperature | — | Temperature of discharge temperature thermistor has been 122°F (50°C) or less for 20 minutes. | •Refer to 10-5.Ⓚ"Check of LEV".<br>•Check refrigerant circuit and refrigerant amount. | — | ○ |
| 11-time flash 2.5 seconds OFF | DC voltage | 8-time flash 2.5 seconds OFF | DC voltage of inverter cannot be detected normally. | •Refer to 10-5.Ⓐ"How to check inverter/ compressor". | — | ○ |
| | Each phase current of compressor | 9-time flash 2.5 seconds OFF | Each phase current of compressor cannot be detected normally. | | | |
| 12-time flash 2.5 seconds OFF | Overcurrent Compressor open-phase | 10-time flash 2.5 seconds OFF | Large current flows into intelligent power module (IPM). The open-phase operation of compressor is detected. The interphase short circuit occurs in the output of the intelligent power module (IPM). The compressor winding shorts circuit. | •Reconnect compressor connector.<br>•Refer to 10-5. Ⓐ"How to check inverter/ compressor". | — | ○ |
| 14-time flash 2.5 seconds OFF | Stop valve (Closed valve) | 14-time flash 2.5 seconds OFF | Closed valve is detected by compressor current. | •Check stop valve | ○ | ○ |

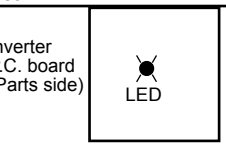
**NOTE**: Blinking patterns of this mode differ from the ones of Troubleshooting check table (10-3.).

## 10-3. TROUBLESHOOTING CHECK TABLE

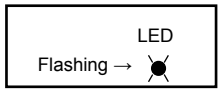
| No. | Symptom | LED indication | Abnormal point/ Condition | Condition | Remedy |
|---|---|---|---|---|---|
| 1 | Outdoor unit does not operate. | 1-time flash every 2.5 seconds | Outdoor power system | Overcurrent protection stop is continuously performed 3 times within 1 minute after the compressor gets started, or failure of restart of compressor has repeated 24 times. | •Reconnect connector of compressor.<br>•Refer to 10-5.Ⓐ "How to check inverter/ compressor".<br>•Check stop valve. |
| 2 | | | Outdoor thermistors | Discharge temperature thermistor, fin temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor, P.C. board temperature thermistor or ambient temperature thermistor shorts or opens during compressor running. | •Refer to 10-5.Ⓖ "Check of outdoor thermistors". |
| 3 | | | Outdoor control system | Nonvolatile memory data cannot be read properly.<br>(The upper lamp of OPERATION INDICATOR of the indoor unit lights up or flashes 7 times.) | •Replace inverter P.C. board. |
| 4 | | 6-time flash<br>2.5 seconds OFF | Serial signal | The communication fails between the indoor and outdoor unit for 3 minutes. | •Refer to 10-5.Ⓜ "How to check miswiring and serial signal error. |
| 5 | | 11-time flash<br>2.5 seconds OFF | Stop valve/ Closed valve | Closed valve is detected by compressor current. | •Check stop valve. |
| 6 | | 14-time flash<br>2.5 seconds OFF | Outdoor unit (Other abnormality) | Outdoor unit is defective. | •Refer to 10-2.2. "Flow chart of the detailed outdoor unit failure mode recall function". |
| 7 | 'Outdoor unit stops and restarts 3 minutes later' is repeated. | 2-time flash<br>2.5 seconds OFF | Overcurrent protection | Large current flows into intelligent power module.<br>※ When overcurrent protection occurs within 10 seconds after compressor starts, compressor restarts after 15 seconds **(MUZ-GE09/12/15/18NA, MUY-GE09/12/15/18NA)**. | •Reconnect connector of compressor.<br>•Refer to 10-5.Ⓐ "How to check inverter/ compressor".<br>•Check stop valve. |
| 8 | | 3-time flash<br>2.5 seconds OFF | Discharge temperature overheat protection | Temperature of discharge temperature thermistor exceeds 241°F (116°C), compressor stops. Compressor can restart if discharge temperature thermistor reads 212°F (100°C) or less 3 minutes later. | •Check refrigerant circuit and refrigerant amount.<br>•Refer to 10-5.Ⓚ "Check of LEV". |
| 9 | | 4-time flash<br>2.5 seconds OFF | Fin temperature /P.C. board temperature thermistor overheat protection | Temperature of fin temperature thermistor on the heat sink exceeds 167 ~ 176°F (75 ~ 80°C) or temperature of P.C. board temperature thermistor on the inverter P.C. board exceeds 158 ~ 167 °F (70 ~ 75°C). | •Check around outdoor unit.<br>•Check outdoor unit air passage.<br>•Refer to 10-5.Ⓘ "Check of outdoor fan motor". |
| 10 | | 5-time flash<br>2.5 seconds OFF | High pressure protection | Temperature of indoor coil thermistor exceeds 158°F (70°C) in HEAT mode **(MUZ only)**. Temperature of outdoor heat exchanger temperature thermistor exceeds 158°F (70°C) in COOL mode. | •Check refrigerant circuit and refrigerant amount.<br>•Check stop valve. |
| 11 | | 8-time flash<br>2.5 seconds OFF | Compressor synchronous abnormality | The waveform of compressor current is distorted. | •Reconnect connector of compressor.<br>•Refer to 10-5.Ⓐ "How to check inverter/ compressor". |
| 12 | | 10-time flash<br>2.5 seconds OFF | Outdoor fan motor | Outdoor fan has stopped 3 times in a row within 30 seconds after outdoor fan start-up. | •Refer to 10-5.Ⓘ "Check of outdoor fan motor.<br>•Refer to 10-5.Ⓛ "Check of inverter P.C. board. |
| 13 | | 12-time flash<br>2.5 seconds OFF | Each phase current of compressor | Each phase current of compressor cannot be detected normally. | •Refer to 10-5.Ⓐ "How to check inverter/ compressor". |
| 14 | | 13-time flash<br>2.5 seconds OFF | DC voltage | DC voltage of inverter cannot be detected normally. | •Refer to 10-5.Ⓐ "How to check inverter/ compressor". |
| 15 | Outdoor unit operates. | 1-time flash<br>2.5 seconds OFF | Frequency drop by current protection | Current from power outlet is nearing Max. fuse size. | The unit is normal, but check the following.<br>•Check if indoor filters are clogged.<br>•Check if refrigerant is short.<br>•Check if indoor/outdoor unit air circulation is short cycled. |
| 16 | | 3-time flash<br>2.5 seconds OFF | Frequency drop by high pressure protection | Temperature of indoor coil thermistor exceeds 131°F (55°C) in HEAT mode, compressor frequency lowers. | |
| | | | Frequency drop by defrosting in COOL mode | Indoor coil thermistor reads 46°F (8°C) or less in COOL mode, compressor frequency lowers. | |
| 17 | | 4-time flash<br>2.5 seconds OFF | Frequency drop by discharge temperature protection | Temperature of discharge temperature thermistor exceeds 232°F (111°C), compressor frequency lowers. | •Check refrigerant circuit and refrigerant amount.<br>•Refer to 10-5.Ⓚ "Check of LEV".<br>•Refer to 10-5.Ⓖ "Check of outdoor thermistors". |
| 18 | Outdoor unit operates. | 7-time flash<br>2.5 seconds OFF | Low discharge temperature protection | Temperature of discharge temperature thermistor has been 122°F (50°C) or less for 20 minutes. | •Refer to 10-5.Ⓚ "Check of LEV".<br>•Check refrigerant circuit and refrigerant amount. |
| 19 | | 8-time flash<br>2.5 seconds OFF | PAM protection PAM: Pulse Amplitude Modulation | The overcurrent flows into IGBT (Insulated Gate Bipolar transistor: TR821) or the bus-bar voltage reaches 320 V or more, PAM stops and restarts. | This is not malfunction. PAM protection will be activated in the following cases:<br>1 Instantaneous power voltage drop (Short time power failure)<br>2 When the power supply voltage is high. |
| | | | Zero cross detecting circuit | Zero cross signal for PAM control cannot be detected. | |
| 20 | | 9-time flash<br>2.5 seconds OFF | Inverter check mode | The connector of compressor is disconnected, inverter check mode starts. | •Check if the connector of the compressor is correctly connected. Refer to 10-5.Ⓐ "How to check inverter/compressor". |

**NOTE**: 1. The location of LED is illustrated at the right figure. Refer to 10-6.1.
2. LED is lighted during normal operation.
The flashing frequency shows the number of times the LED blinks after every 2.5-second OFF. Flashing
(Example) When the flashing frequency is "2".



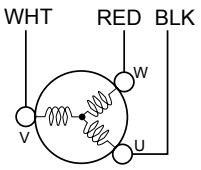
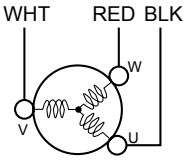
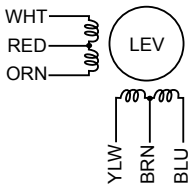

**MUZ/MUY-GE24NA**




**MUZ/MUY-GE09/12/15/18NA**

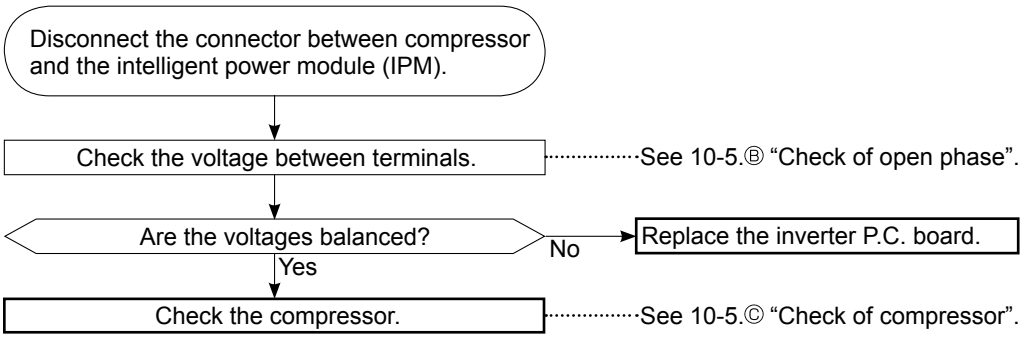
### 10-4. TROUBLE CRITERION OF MAIN PARTS

## MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA MUZ-GE18NA MUZ-GE24NA
## MUY-GE09NA MUY-GE12NA MUY-GE15NA MUY-GE18NA MUY-GE24NA

<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Defrost thermistor (RT61)<br>(MUZ)<br>Fin temperature thermistor (RT64)<br><br>Ambient temperature thermistor (RT65)<br><br>Outdoor heat exchanger temperature thermistor (RT68)</td><td>Measure the resistance with a tester.<br><br>Refer to 10-6. “Test point diagram and voltage”, 1. “Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Discharge temperature thermistor (RT62)</td><td>Measure the resistance with a tester. Before measurement, hold the thermistor with your hands to warm it up.<br><br>Refer to 10-6. “Test point diagram and voltage”, 1. “Inverter P.C. board”, for the chart of thermistor.</td><td></td></tr>
<tr><td>Compressor</td><td>Measure the resistance between terminals using a tester.<br>(Temperature: -4 ~ 104°F (-20 ~ 40°C))<br><table><tr><th></th><th colspan="4">Normal (Ω)</th></tr><tr><th></th><th>GE09</th><th>GE12</th><th>GE15/18</th><th>GE24</th></tr><tr><td>U-V<br>U-W<br>V-W</td><td>1.36 ~ 1.93</td><td>1.52 ~ 2.17</td><td>0.78 ~ 1.11</td><td>0.83 ~ 1.18</td></tr></table></td><td> 
</td></tr>
<tr><td>Outdoor fan motor</td><td>Measure the resistance between lead wires using a tester.<br>(Temperature: -4 ~ 104°F (-20 ~ 40°C))<br><table><tr><th rowspan="2">Color of lead wire</th><th colspan="3">Normal (Ω)</th></tr><tr><th>GE09/12</th><th>GE15</th><th>GE18/24</th></tr><tr><td>RED – BLK<br>BLK – WHT<br>WHT – RED</td><td colspan="2">28 ~ 40</td><td>11 ~ 16</td></tr></table></td><td> 
</td></tr>
<tr><td>R. V. coil (21S4)<br>(MUZ)</td><td>Measure the resistance using a tester.<br>(Temperature: 14 ~ 104°F (-10 ~ 40°C))<br><table><tr><th>Normal (kΩ)</th></tr><tr><td>0.97 ~ 1.38</td></tr></table></td><td></td></tr>
<tr><td>Expansion valve coil (LEV)</td><td>Measure the resistance using a tester.<br>(Temperature: 14 ~ 104°F (-10 ~ 40°C))<br><table><tr><th>Color of lead wire</th><th>Normal (Ω)</th></tr><tr><td>WHT – RED</td><td rowspan="4">37 ~ 54</td></tr><tr><td>RED – ORN</td></tr><tr><td>YLW – BRN</td></tr><tr><td>BRN – BLU</td></tr></table></td><td> 
</td></tr>
</table>

## 10-5. TROUBLESHOOTING FLOW

### Ⓐ How to check inverter/compressor


Disconnect the connector between compressor and the intelligent power module (IPM).
Check the voltage between terminals.
See 10-5.Ⓑ "Check of open phase".
Are the voltages balanced?
No
Replace the inverter P.C. board.
Yes
Check the compressor.
See 10-5.Ⓒ "Check of compressor".

### Ⓑ Check of open phase

- With the connector between the compressor and the intelligent power module disconnected, activate the inverter and check if the inverter is normal by measuring the voltage balance between the terminals.

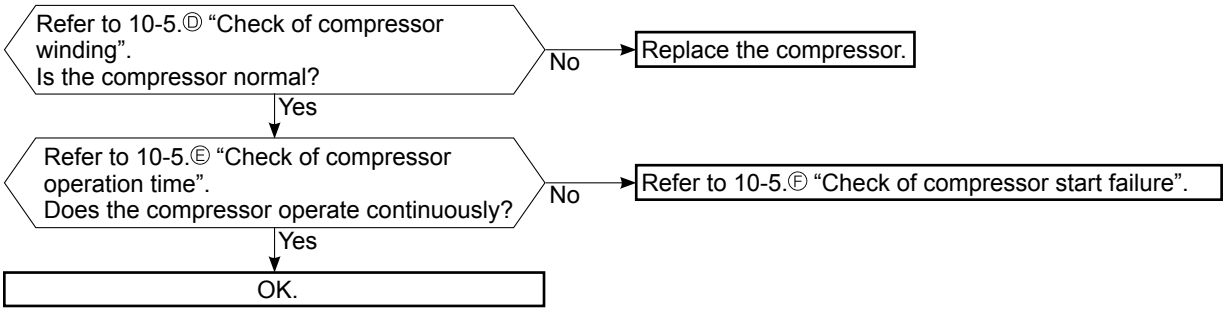
Output voltage is 50 - 130 V. (The voltage may differ according to the tester.)

<< Operation method>>
Start cooling or heating operation by pressing EMERGENCY OPERATION switch on the indoor unit. (TEST RUN OPERATION: Refer to 7-6.)
<<Measurement point>>
at 3 points
BLK (U) - WHT (V)
BLK (U) - RED (W)
WHT(V) - RED (W)

Measure AC voltage between the lead wires at 3 points.

**NOTE**: 1. Output voltage varies according to power supply voltage.
2. Measure the voltage by analog type tester.
3. During this check, LED of the inverter P.C. board flashes 9 times. (Refer to 10-6.1.)

### Ⓒ Check of compressor



## Ⓓ Check of compressor winding

● Disconnect the connector between the compressor and intelligent power module, and measure the resistance between the compressor terminals.

<<Measurement point>>

at 3 points

BLK - WHT

BLK - RED ※ Measure the resistance between the lead wires at 3 points.

WHT - RED

<<Judgement>>

Refer to 10-4.

0[Ω] ····· Abnormal [short]

Infinite [Ω]····· Abnormal [open]

**NOTE**: Be sure to zero the ohmmeter before measurement.

## Ⓔ Check of compressor operation time

● Connect the compressor and activate the inverter. Then measure the time until the inverter stops due to over current.

<<Operation method>>

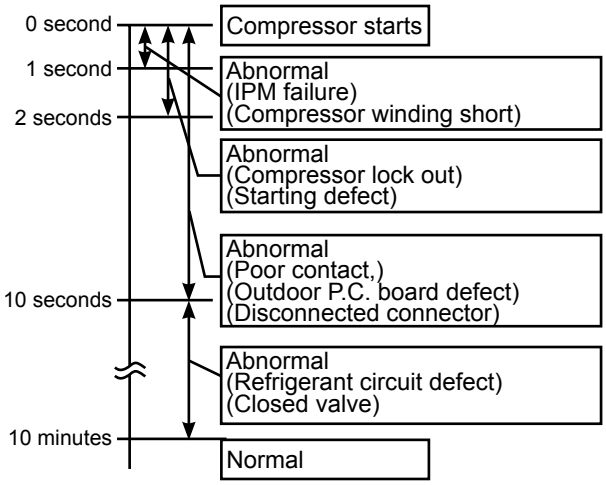
Start heating or cooling operation by pressing EMERGENCY OPERATION switch on the indoor unit.

(TEST RUN OPERATION: Refer to 7-6.)

<<Measurement>>

Measure the time from the start of compressor to the stop of compressor due to overcurrent.

<<Judgement>>




## Ⓕ Check of compressor start failure

Confirm that 1~4 is normal.

• Electrical circuit check

1. Contact of the compressor connector
2. Output voltage of inverter P.C. board and balance of them (See 10-5.Ⓑ)
3. Direct current voltage between DB61(+) and (-) (**MUZ/MUY-GE09/12/15/18NA)**/ JP715(+) and JP30(-) (**MUZ/MUY-GE24NA)** on the inverter P.C. board
4. Voltage between outdoor terminal block S1-S2

Does the compressor run for 10 seconds or more after it starts?

Yes → Check the refrigerant circuit. Check the stop valve.

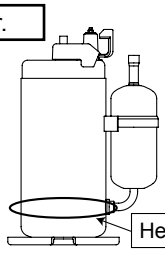
No

After the compressor is heated with a drier, does the compressor start? ※1

No → Replace the compressor.

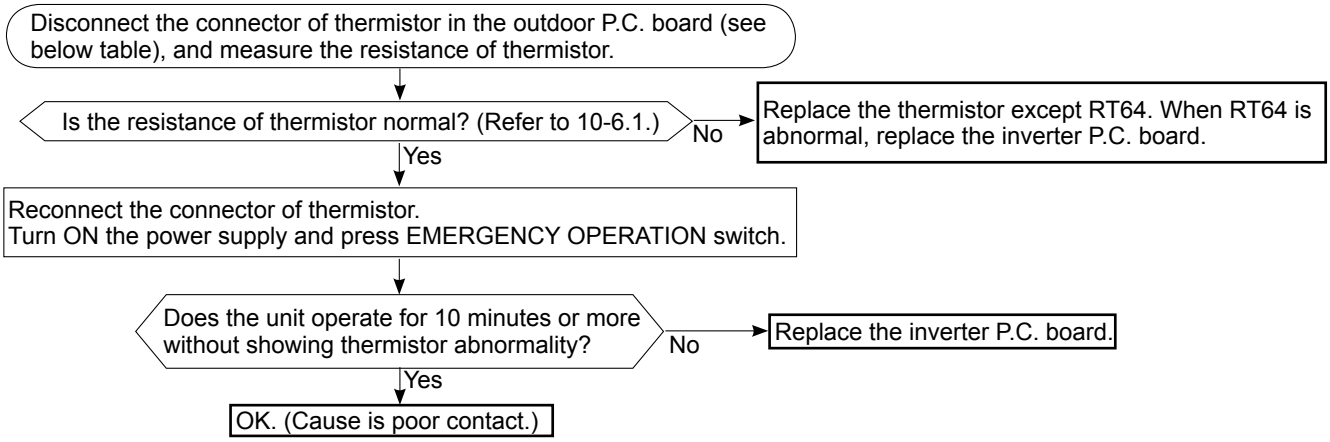
Yes

Compressor start failure. Activate pre-heat control. (Refer to 9-2. "PRE-HEAT CONTROL SETTING")




※1
Heat the compressor with a drier for about 20 minutes. Do not recover refrigerant gas while heating.

## Ⓖ Check of outdoor thermistors


Disconnect the connector of thermistor in the outdoor P.C. board (see below table), and measure the resistance of thermistor.
Is the resistance of thermistor normal? (Refer to 10-6.1.)
No
Replace the thermistor except RT64. When RT64 is abnormal, replace the inverter P.C. board.
Yes
Reconnect the connector of thermistor.
Turn ON the power supply and press EMERGENCY OPERATION switch.
Does the unit operate for 10 minutes or more without showing thermistor abnormality?
No
Replace the inverter P.C. board.
Yes
OK. (Cause is poor contact.)

**MUZ/MUY-GE09/12/15/18NA**

| Thermistor | Symbol | Connector, Pin No. | Board |
|---|---|---|---|
| Defrost **(MUZ)** | RT61 | Between CN641 pin1 and pin2 | Inverter P.C. board |
| Discharge temperature | RT62 | Between CN641 pin3 and pin4 | |
| Fin temperature | RT64 | Between CN642 pin1 and pin2 | |
| Ambient temperature | RT65 | Between CN643 pin1 and pin2 | |
| Outdoor heat exchanger temperature | RT68 | Between CN644 pin1 and pin3 | |

**MUZ/MUY-GE24NA**

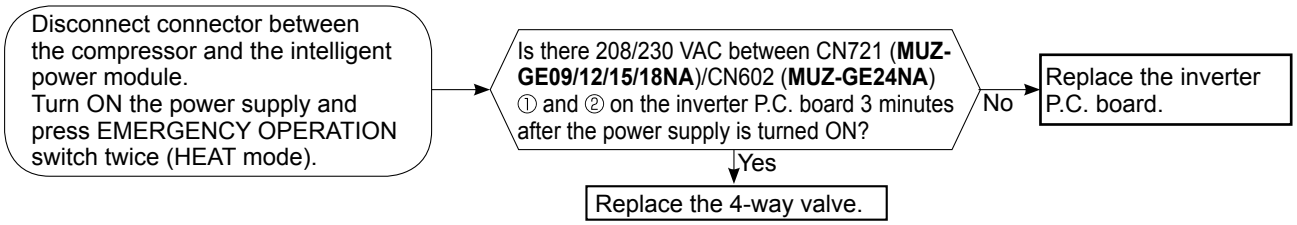
| Thermistor | Symbol | Connector, Pin No. | Board |
|---|---|---|---|
| Defrost **(MUZ)** | RT61 | Between CN671 pin1 and pin2 | Inverter P.C. board |
| Discharge temperature | RT62 | Between CN671 pin3 and pin4 | |
| Fin temperature | RT64 | Between CN673 pin1 and pin2 | |
| Ambient temperature | RT65 | Between CN672 pin1 and pin2 | |
| Outdoor heat exchanger temperature | RT68 | Between CN671 pin5 and pin6 | |

## Ⓗ Check of R.V. coil

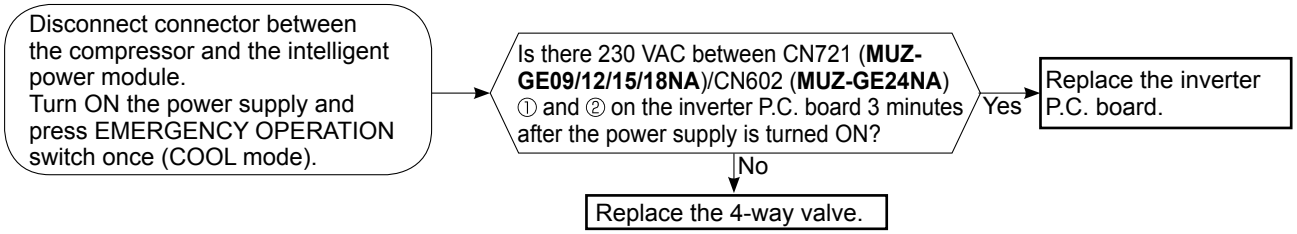
**MUZ-GE09/12/15/18/24NA**

※ First of all, measure the resistance of R.V. coil to check if the coil is defective. Refer to 10-4.
※ In case CN721 (**MUZ-GE09/12/15/18NA**)/CN602 (**MUZ-GE24NA**) is disconnected or R.V. coil is open, voltage is generated between the terminal pins of the connector although no signal is being transmitted to R.V. coil. Check if CN721 (**MUZ-GE09/12/15/18NA**)/CN602 (**MUZ-GE24NA**) is connected.

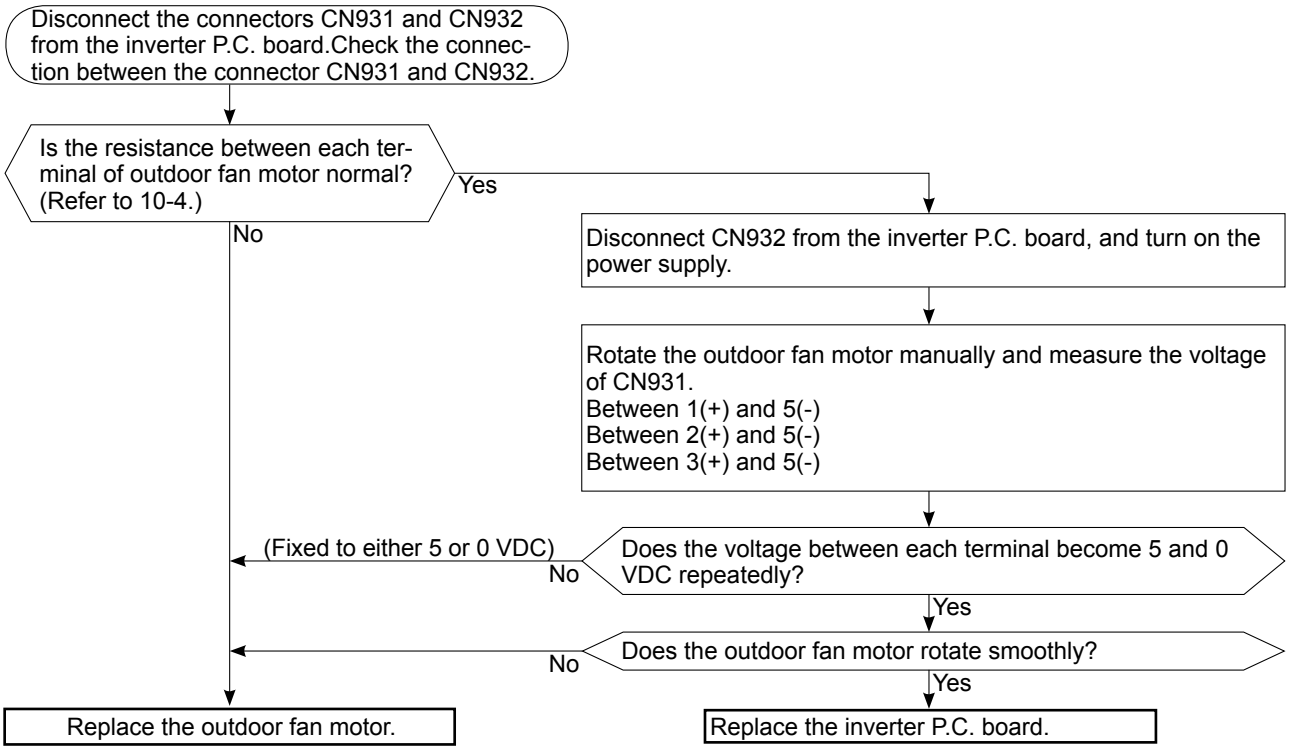
**Unit operates COOL mode even if it is set to HEAT mode.**


Disconnect connector between the compressor and the intelligent power module.
Turn ON the power supply and press EMERGENCY OPERATION switch twice (HEAT mode).
Is there 208/230 VAC between CN721 (MUZ-GE09/12/15/18NA)/CN602 (MUZ-GE24NA) ① and ② on the inverter P.C. board 3 minutes after the power supply is turned ON?
No
Replace the inverter P.C. board.
Yes
Replace the 4-way valve.

**Unit operates HEAT mode even if it is set to COOL mode.**

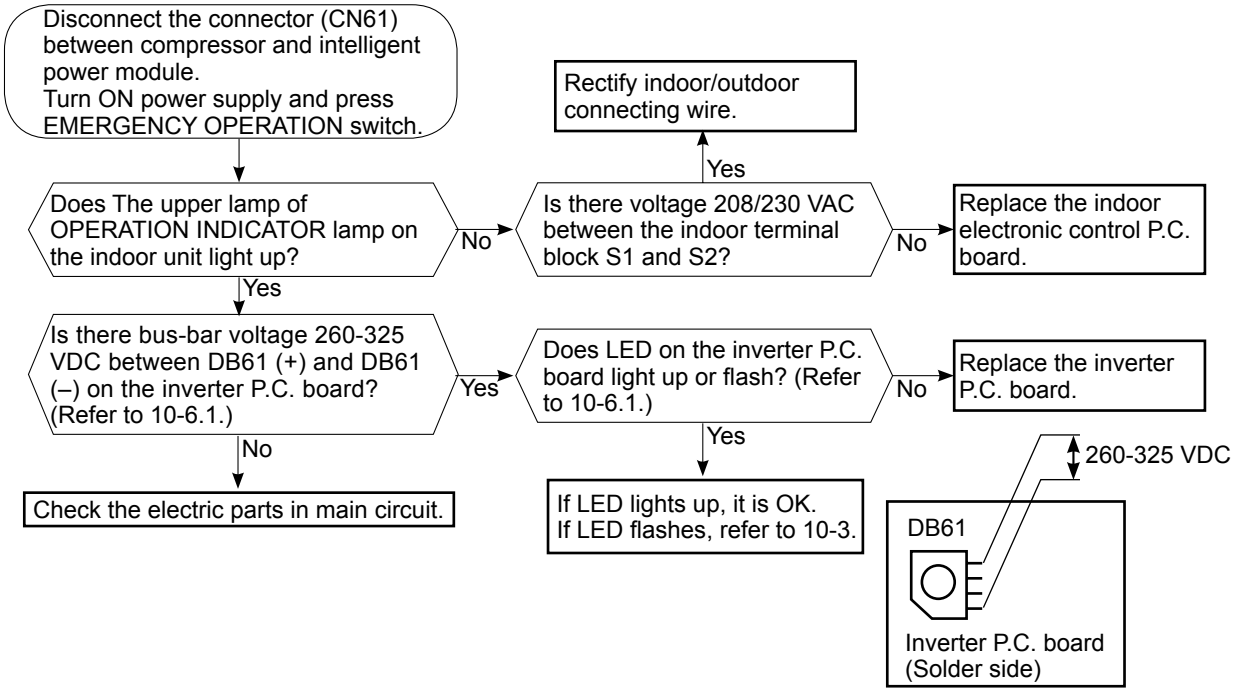

Disconnect connector between the compressor and the intelligent power module.
Turn ON the power supply and press EMERGENCY OPERATION switch once (COOL mode).
Is there 230 VAC between CN721 (MUZ-GE09/12/15/18NA)/CN602 (MUZ-GE24NA) ① and ② on the inverter P.C. board 3 minutes after the power supply is turned ON?
Yes
Replace the inverter P.C. board.
No
Replace the 4-way valve.

## ⓘ Check of outdoor fan motor

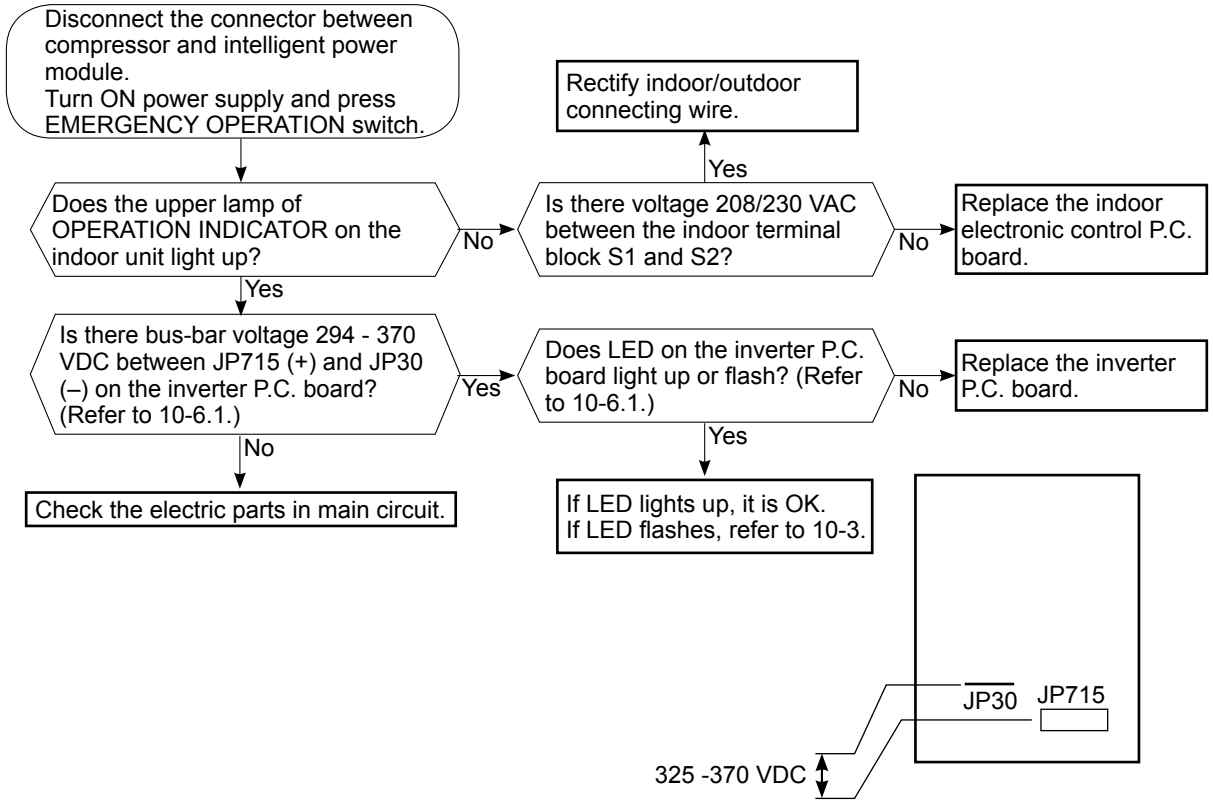

Disconnect the connectors CN931 and CN932 from the inverter P.C. board.Check the connection between the connector CN931 and CN932.
Is the resistance between each terminal of outdoor fan motor normal? (Refer to 10-4.)
Yes
No
Disconnect CN932 from the inverter P.C. board, and turn on the power supply.
Rotate the outdoor fan motor manually and measure the voltage of CN931.
Between 1(+) and 5(-)
Between 2(+) and 5(-)
Between 3(+) and 5(-)
Does the voltage between each terminal become 5 and 0 VDC repeatedly?
(Fixed to either 5 or 0 VDC)
No
Yes
Does the outdoor fan motor rotate smoothly?
No
Yes
Replace the outdoor fan motor.
Replace the inverter P.C. board.

## Ⓙ Check of power supply

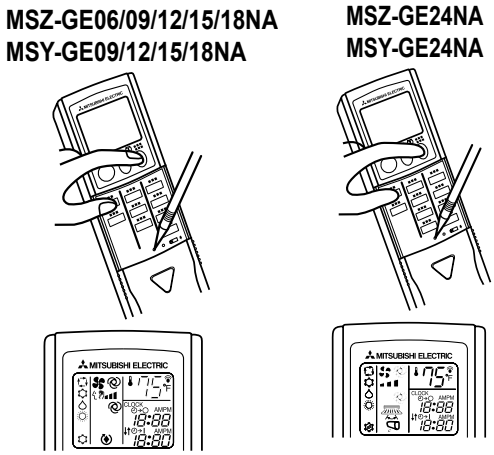
### MUZ-GE09/12/15/18NA MUY-GE09/12/15/18NA


Disconnect the connector (CN61) between compressor and intelligent power module.
Turn ON power supply and press EMERGENCY OPERATION switch.
Does The upper lamp of OPERATION INDICATOR lamp on the indoor unit light up?
No
Is there voltage 208/230 VAC between the indoor terminal block S1 and S2?
Yes
Rectify indoor/outdoor connecting wire.
No
Replace the indoor electronic control P.C. board.
Yes
Is there bus-bar voltage 260-325 VDC between DB61 (+) and DB61 (–) on the inverter P.C. board? (Refer to 10-6.1.)
Yes
Does LED on the inverter P.C. board light up or flash? (Refer to 10-6.1.)
No
Replace the inverter P.C. board.
No
Check the electric parts in main circuit.
Yes
If LED lights up, it is OK.
If LED flashes, refer to 10-3.
260-325 VDC
DB61
Inverter P.C. board
(Solder side)

### MUZ-GE24NA MUY-GE24NA


Disconnect the connector between compressor and intelligent power module.
Turn ON power supply and press EMERGENCY OPERATION switch.
Does the upper lamp of OPERATION INDICATOR on the indoor unit light up?
No
Is there voltage 208/230 VAC between the indoor terminal block S1 and S2?
Yes
Rectify indoor/outdoor connecting wire.
No
Replace the indoor electronic control P.C. board.
Yes
Is there bus-bar voltage 294 - 370 VDC between JP715 (+) and JP30 (–) on the inverter P.C. board? (Refer to 10-6.1.)
Yes
Does LED on the inverter P.C. board light up or flash? (Refer to 10-6.1.)
No
Replace the inverter P.C. board.
No
Check the electric parts in main circuit.
Yes
If LED lights up, it is OK.
If LED flashes, refer to 10-3.
JP30
JP715
325 -370 VDC

## Ⓚ Check of LEV (Expansion valve)




※1. Regardless of normal or abnormal condition, a short beep is emitted once the signal is received.

Turn ON the power supply.
<Preparation of the remote controller>
① While pressing both OPERATION SELECT button and TOO COOL button on the remote controller at the same time, press RESET button.
② First, release RESET button.
And release the other two buttons after all LCD except the set temperature in operation display section of the remote controller is displayed after 3 seconds.

↓

Press OPERATE/STOP (ON/OFF) button of the remote controller (the set temperature is displayed) with the remote controller headed towards the indoor unit. ※1

↓

Expansion valve operates in full-opening direction.

↓

Do you hear the expansion valve "click, click·····"?
Do you feel the expansion valve vibrate on touching it ?

Yes → OK.

No ↓

Is LEV coil properly fixed to the expansion valve?

No → Properly fix the LEV coil to the expansion valve.

Yes ↓

Does the resistance of LEV coil have the characteristics? (Refer to 10-4.)

Yes →

Measure each voltage between connector pins of CN724 on the inverter P.C. board.
1. Pin③(-) — Pin①(+)
2. Pin④(-) — Pin①(+)
3. Pin⑤(-) — Pin①(+)
4. Pin⑥(-) — Pin①(+)
Is there about 3 ~ 5 VAC between each?
**NOTE**: Measure the voltage by an analog tester.

No → Replace the inverter P.C. board.

Yes ↓

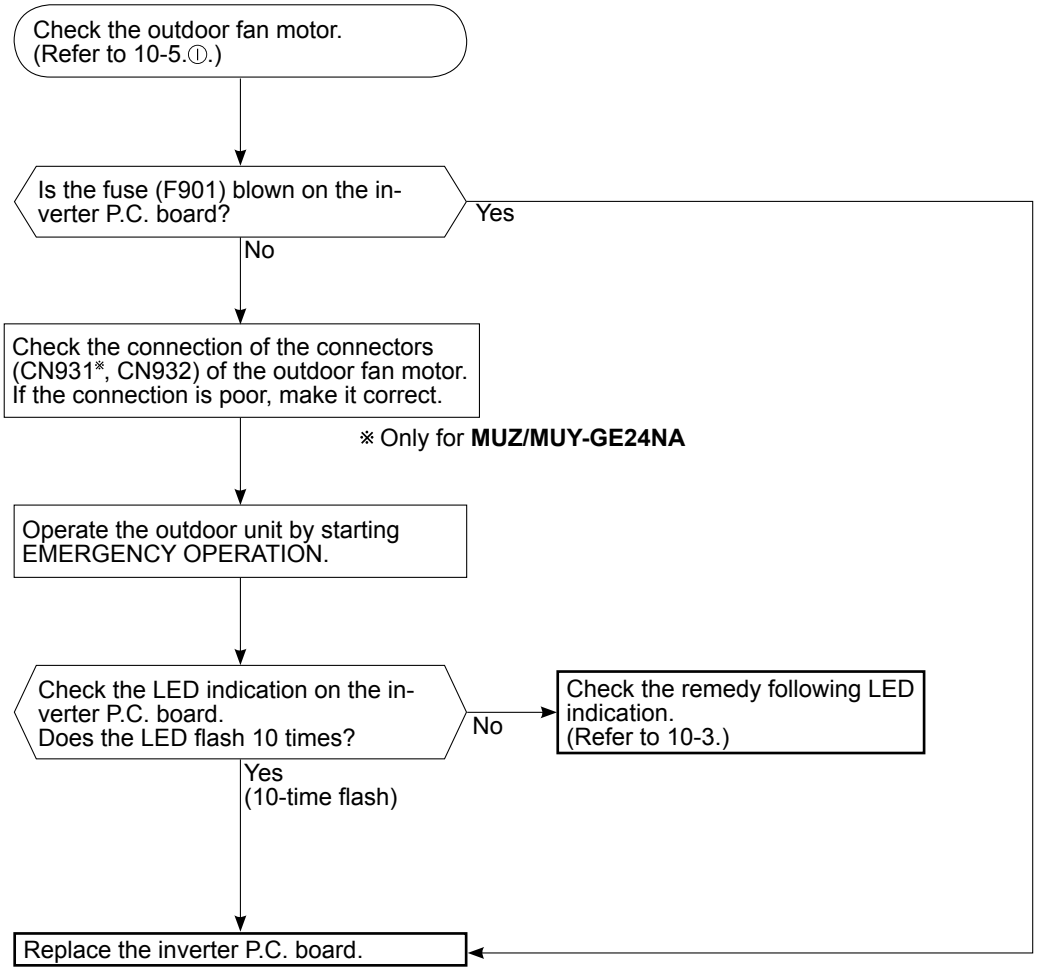
Replace the expansion valve.

No ↓

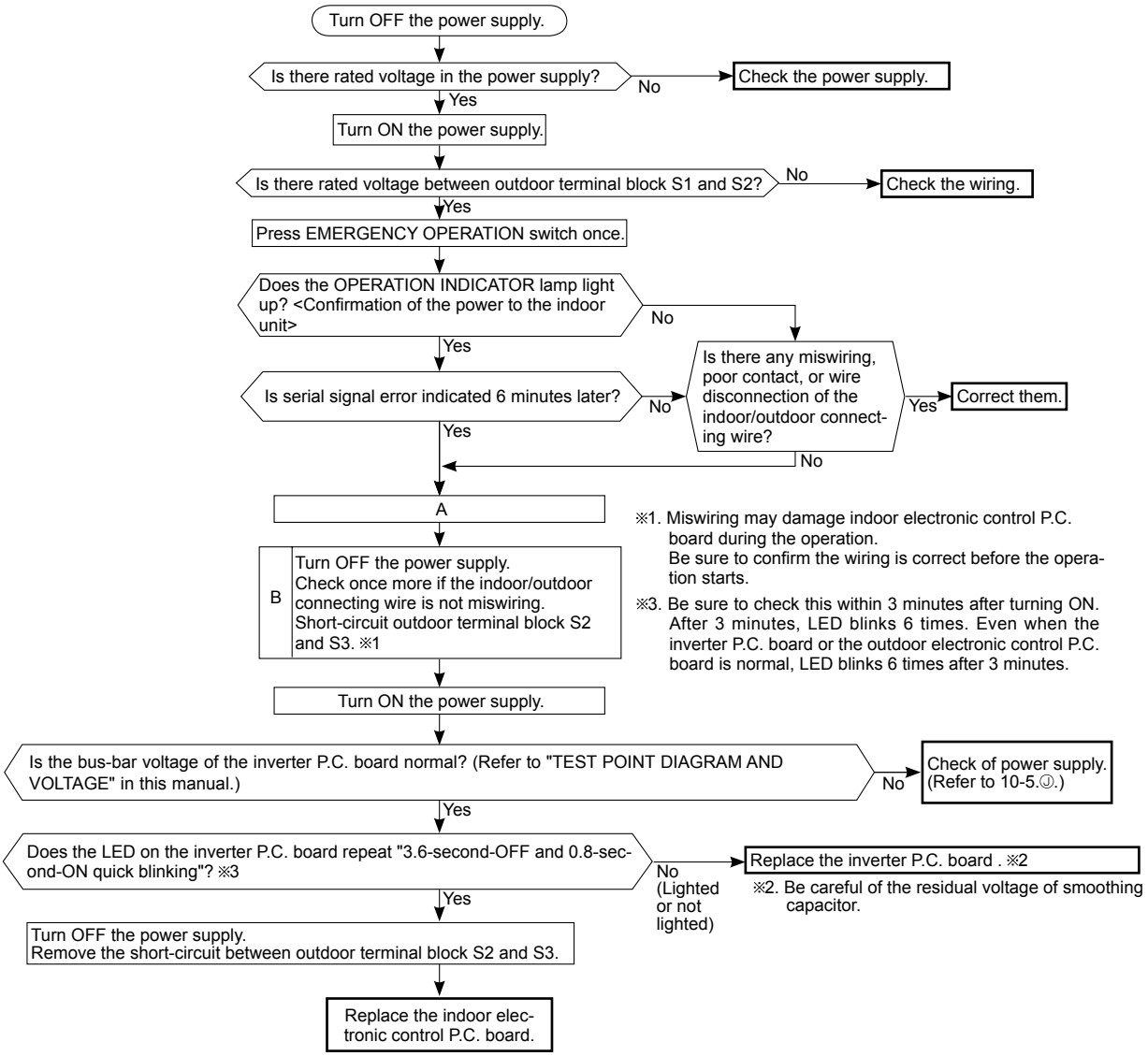
Replace the LEV coil.

**NOTE**: After check of LEV, do the undermentioned operations.
1. Turn OFF the power supply and turn ON it again.
2. Press RESET button on the remote controller.

## Ⓛ Check of inverter P.C. board


Check the outdoor fan motor.
(Refer to 10-5.①.)
Is the fuse (F901) blown on the inverter P.C. board?
Yes
No
Check the connection of the connectors (CN931※, CN932) of the outdoor fan motor.
If the connection is poor, make it correct.
※ Only for MUZ/MUY-GE24NA
Operate the outdoor unit by starting EMERGENCY OPERATION.
Check the LED indication on the inverter P.C. board.
Does the LED flash 10 times?
No
Check the remedy following LED indication.
(Refer to 10-3.)
Yes
(10-time flash)
Replace the inverter P.C. board.

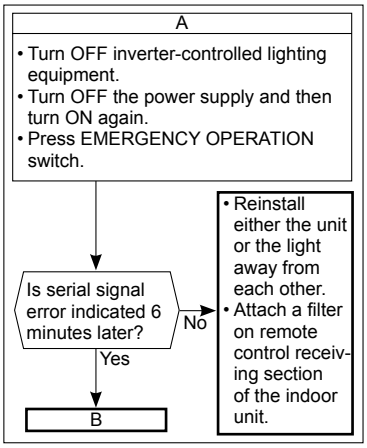
## Ⓜ How to check miswiring and serial signal error


Turn OFF the power supply.
Is there rated voltage in the power supply?
No
Check the power supply.
Yes
Turn ON the power supply.
Is there rated voltage between outdoor terminal block S1 and S2?
No
Check the wiring.
Yes
Press EMERGENCY OPERATION switch once.
Does the OPERATION INDICATOR lamp light up? <Confirmation of the power to the indoor unit>
No
Yes
Is serial signal error indicated 6 minutes later?
No
Is there any miswiring, poor contact, or wire disconnection of the indoor/outdoor connecting wire?
Yes
Correct them.
Yes
No
A
B
Turn OFF the power supply.
Check once more if the indoor/outdoor connecting wire is not miswiring.
Short-circuit outdoor terminal block S2 and S3. ※1
Turn ON the power supply.
Is the bus-bar voltage of the inverter P.C. board normal? (Refer to "TEST POINT DIAGRAM AND VOLTAGE" in this manual.)
No
Check of power supply. (Refer to 10-5.Ⓙ.)
Yes
Does the LED on the inverter P.C. board repeat "3.6-second-OFF and 0.8-second-ON quick blinking"? ※3
No (Lighted or not lighted)
Replace the inverter P.C. board . ※2
Yes
Turn OFF the power supply.
Remove the short-circuit between outdoor terminal block S2 and S3.
Replace the indoor electronic control P.C. board.

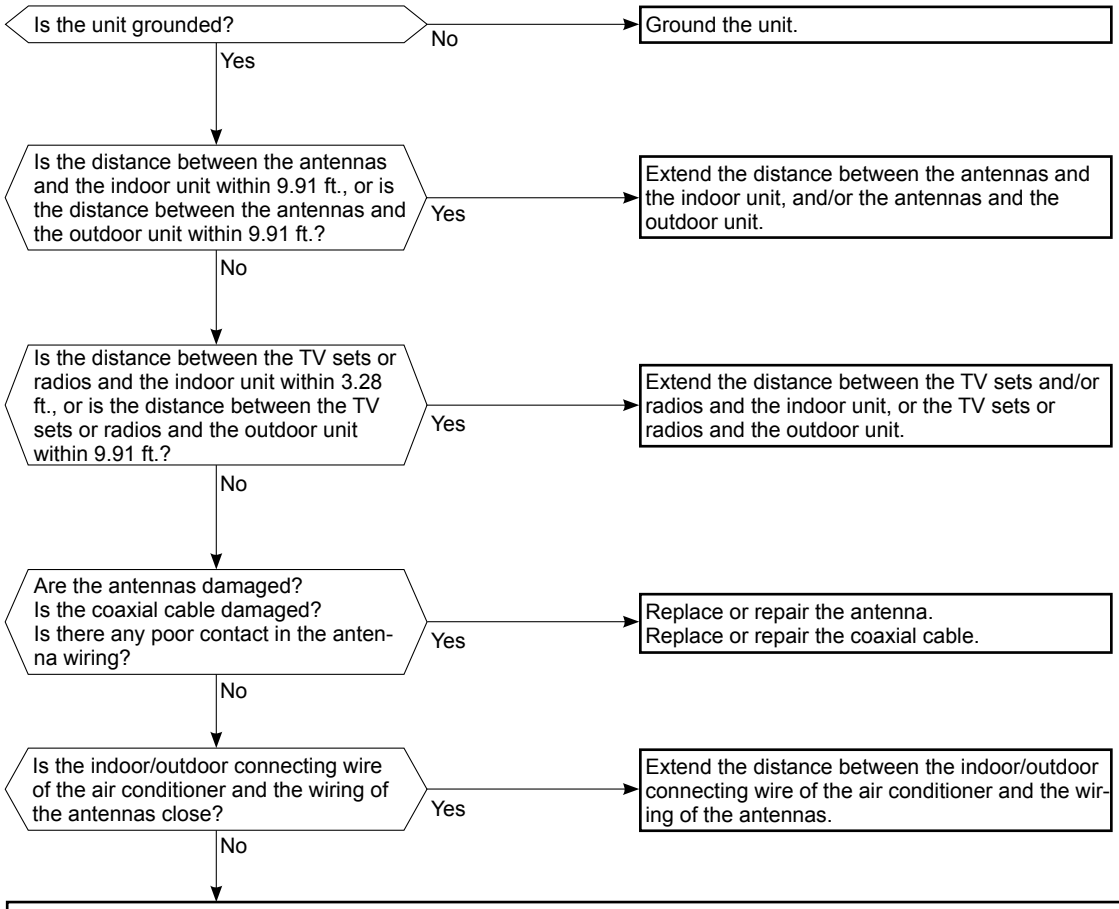
※1. Miswiring may damage indoor electronic control P.C. board during the operation.
Be sure to confirm the wiring is correct before the operation starts.

※3. Be sure to check this within 3 minutes after turning ON. After 3 minutes, LED blinks 6 times. Even when the inverter P.C. board or the outdoor electronic control P.C. board is normal, LED blinks 6 times after 3 minutes.

※2. Be careful of the residual voltage of smoothing capacitor.


A
• Turn OFF inverter-controlled lighting equipment.
• Turn OFF the power supply and then turn ON again.
• Press EMERGENCY OPERATION switch.
Is serial signal error indicated 6 minutes later?
No
• Reinstall either the unit or the light away from each other.
• Attach a filter on remote control receiving section of the indoor unit.
Yes
B

## Ⓝ Electromagnetic noise enters into TV sets or radios


Is the unit grounded?
No
Ground the unit.
Yes
Is the distance between the antennas and the indoor unit within 9.91 ft., or is the distance between the antennas and the outdoor unit within 9.91 ft.?
Yes
Extend the distance between the antennas and the indoor unit, and/or the antennas and the outdoor unit.
No
Is the distance between the TV sets or radios and the indoor unit within 3.28 ft., or is the distance between the TV sets or radios and the outdoor unit within 9.91 ft.?
Yes
Extend the distance between the TV sets and/or radios and the indoor unit, or the TV sets or radios and the outdoor unit.
No
Are the antennas damaged?
Is the coaxial cable damaged?
Is there any poor contact in the antenna wiring?
Yes
Replace or repair the antenna.
Replace or repair the coaxial cable.
No
Is the indoor/outdoor connecting wire of the air conditioner and the wiring of the antennas close?
Yes
Extend the distance between the indoor/outdoor connecting wire of the air conditioner and the wiring of the antennas.
No

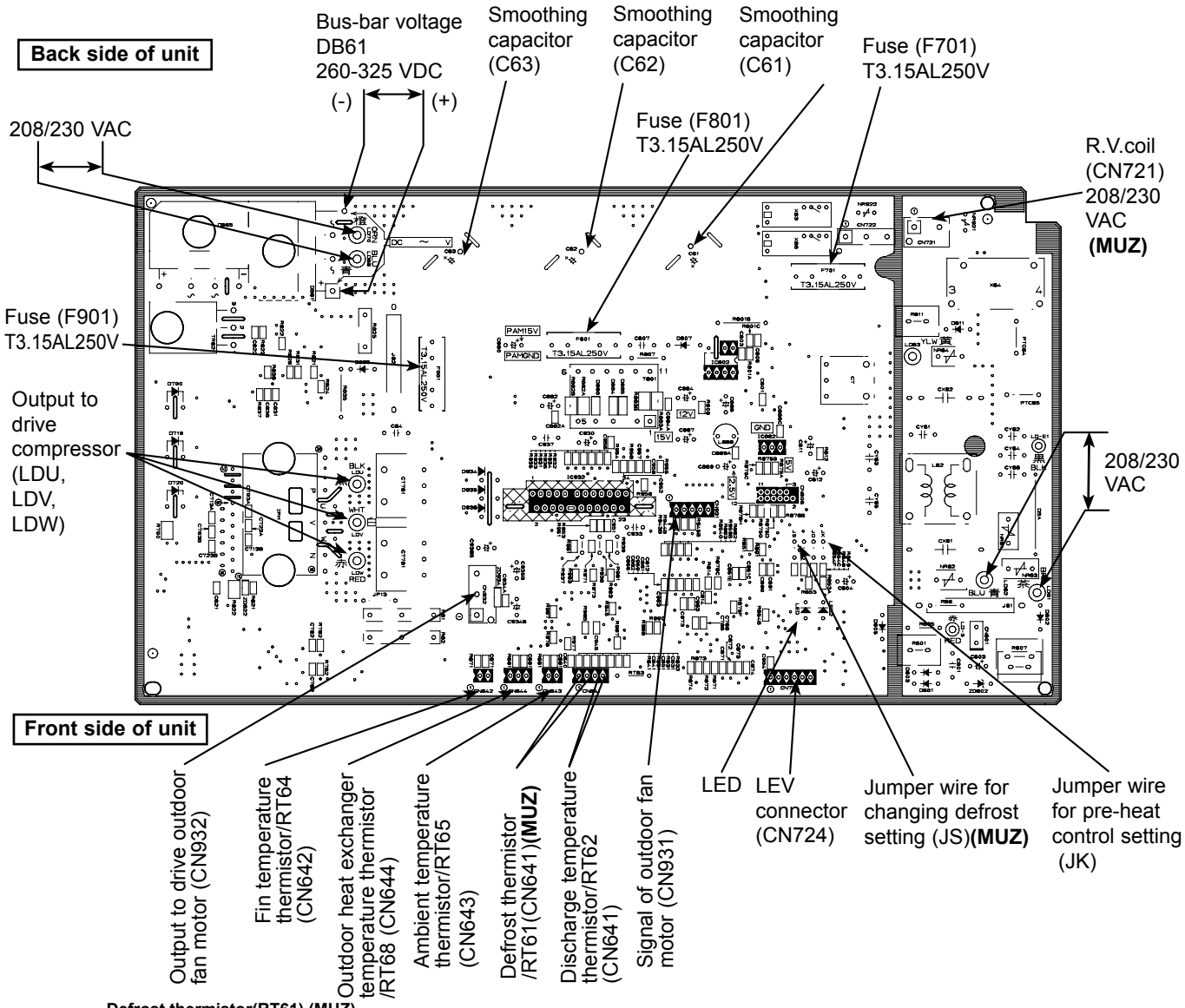
Even if all of the above conditions are fulfilled, the electromagnetic noise may enter, depending on the electric field strength or the installation condition (combination of specific conditions such as antennas or wiring).
Check the followings before asking for service.

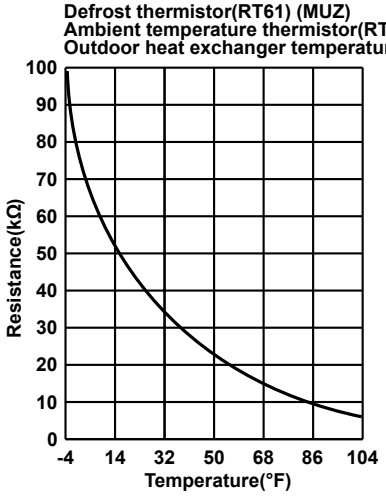
1. Devices affected by the electromagnetic noise
   TV sets, radios (FM/AM broadcast, shortwave)
2. Channel, frequency, broadcast station affected by the electromagnetic noise
3. Channel, frequency, broadcast station unaffected by the electromagnetic noise
4. Layout of:
   indoor/outdoor unit of the air conditioner, indoor/outdoor wiring, grounding wire, antennas, wiring from antennas, receiver
5. Electric field intensity of the broadcast station affected by the electromagnetic noise
6. Presence or absence of amplifier such as booster
7. Operation condition of air conditioner when the electromagnetic noise enters in
   1) Turn OFF the power supply once, and then turn ON the power supply. In this situation, check for the electromagnetic noise.
   2) Within 3 minutes after turning ON the power supply, press OPERATE/STOP (ON/OFF) button on the remote controller for power ON, and check for the electromagnetic noise.
   3) After a short time (3 minutes later after turning ON), the outdoor unit starts running. During operation, check for the electromagnetic noise.
   4) Press OPERATE/STOP (ON/OFF) button on the remote controller for power OFF, when the outdoor unit stops but the indoor/outdoor communication still runs on. In this situation, check for the electromagnetic noise.

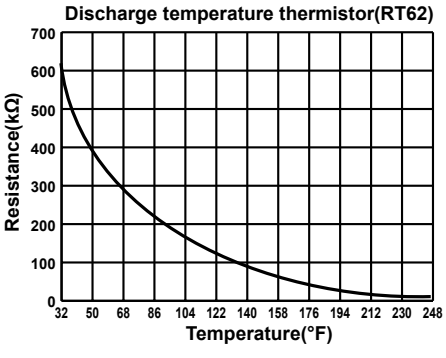
## 10-6. TEST POINT DIAGRAM AND VOLTAGE

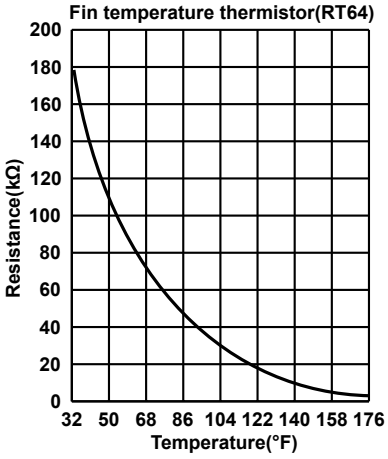
### 1. Inverter P.C. board

### MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA MUY-GE09NA MUY-GE12NA MUY-GE15NA

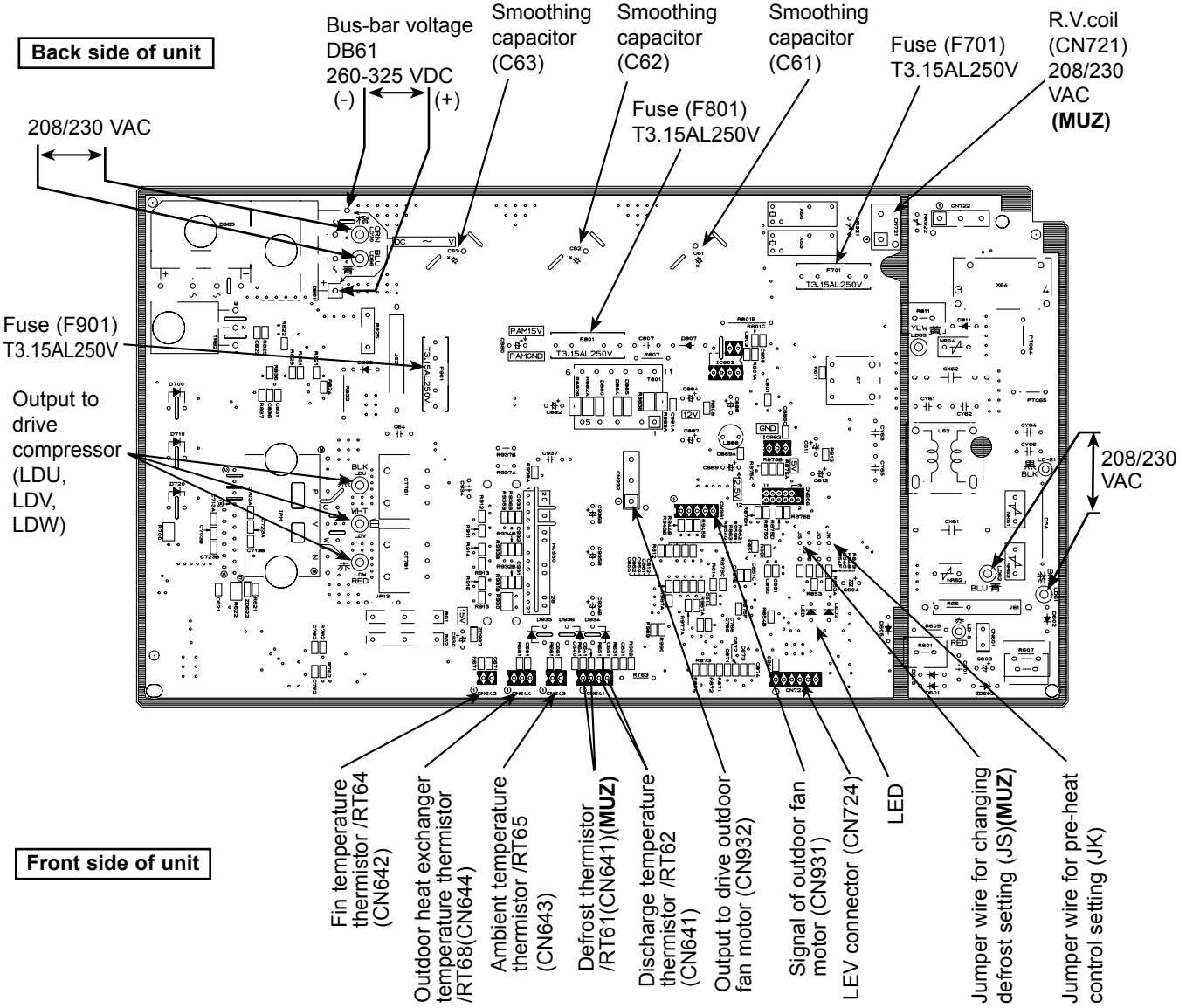


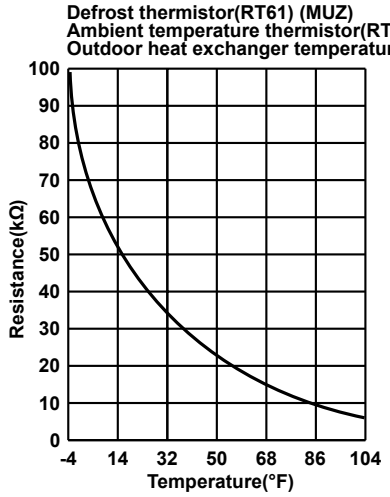



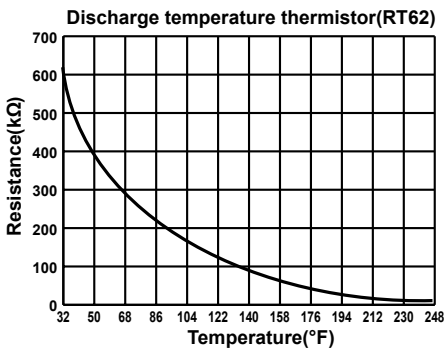



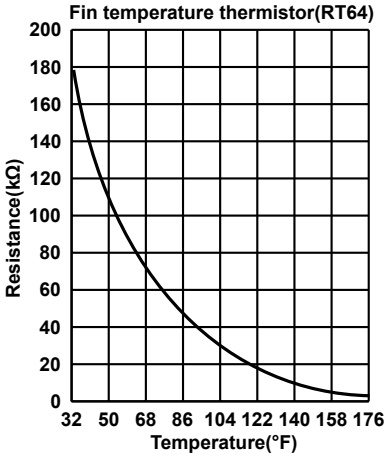



## MUZ-GE18NA MUY-GE18NA

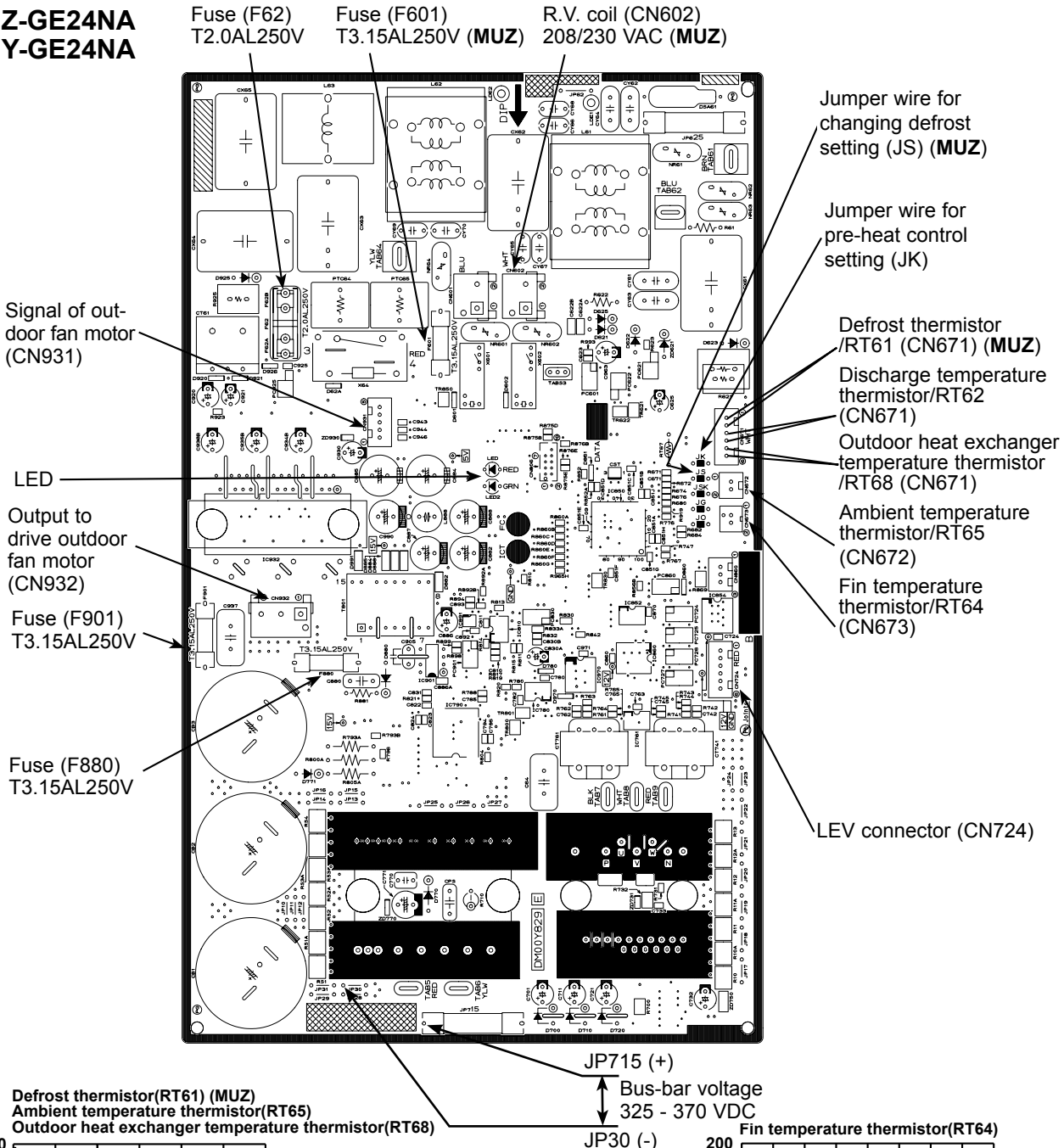


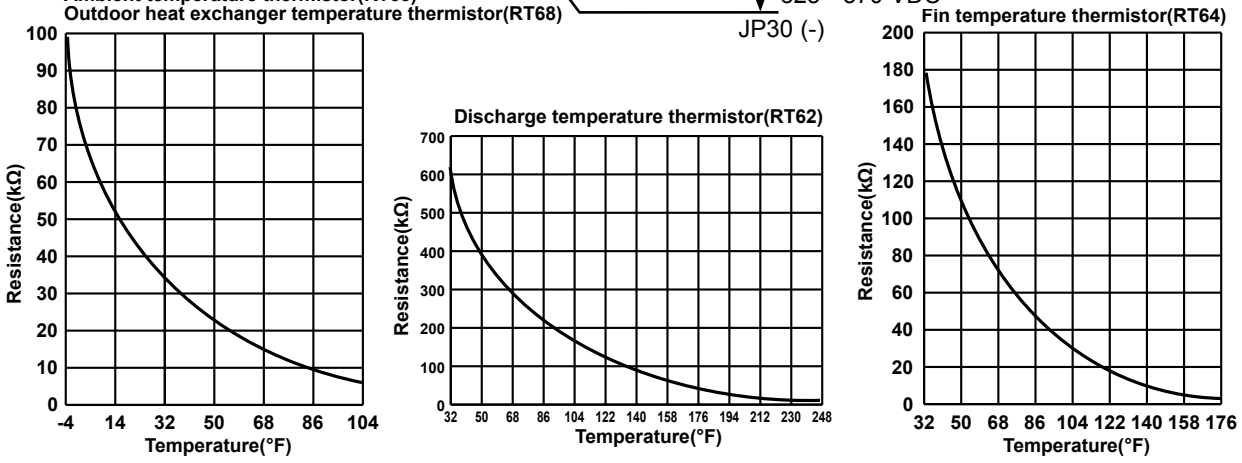



**MUZ-GE24NA**
**MUY-GE24NA**



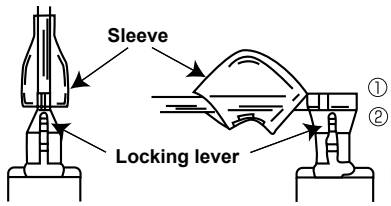



# 11 DISASSEMBLY INSTRUCTIONS

## <"Terminal with locking mechanism" Detaching points>

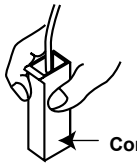
The terminal which has the locking mechanism can be detached as shown below.
There are two types (refer to (1) and (2)) of the terminal with locking mechanism.
The terminal without locking mechanism can be detached by pulling it out.
Check the shape of the terminal before detaching.

(1) Slide the sleeve and check if there is a locking lever or not.




①Slide the sleeve.
②Pull the terminal while pushing the locking lever.

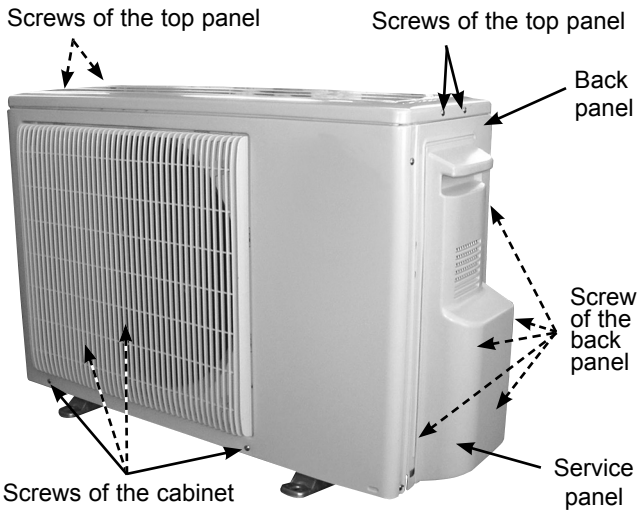
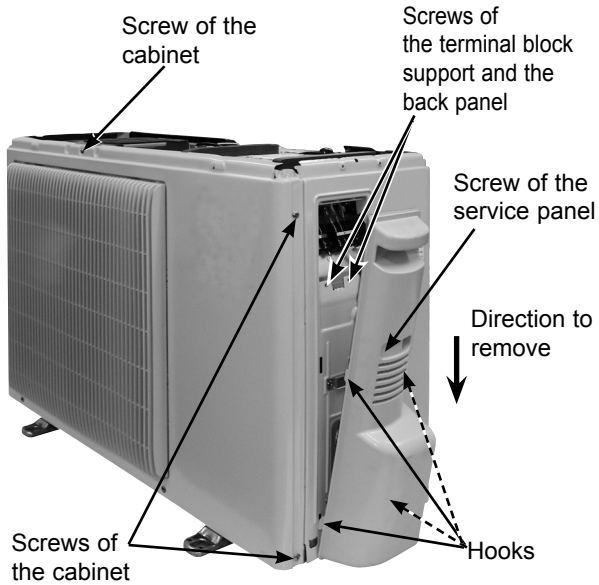
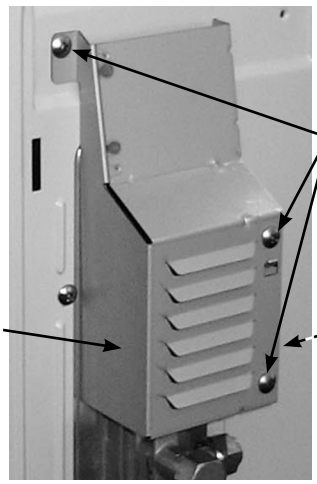
(2) The terminal with this connector has the locking mechanism.

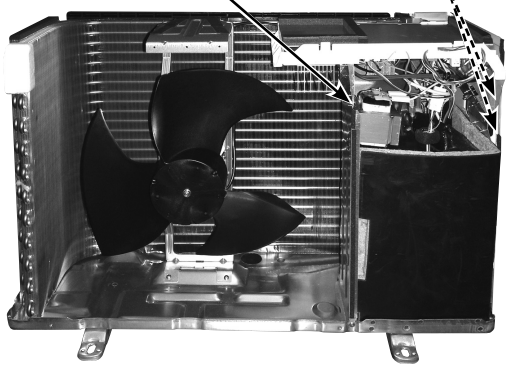
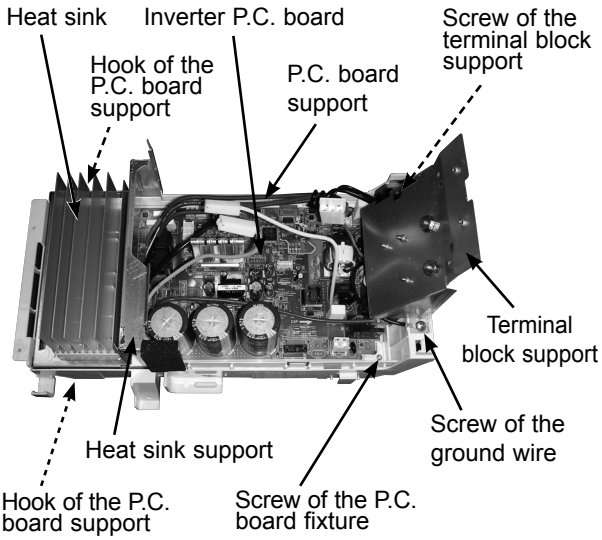
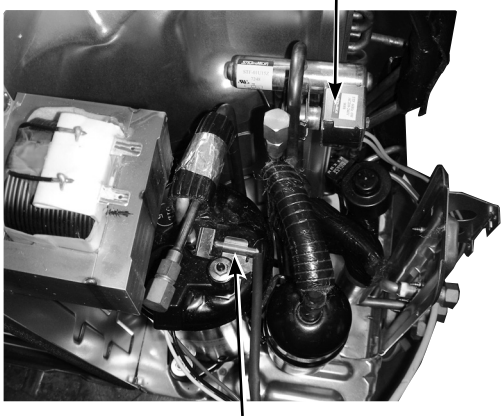


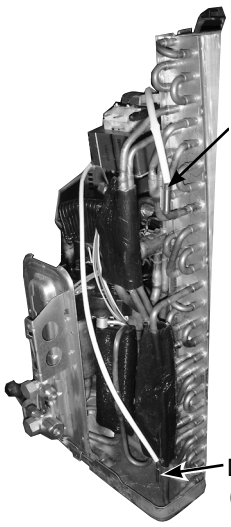
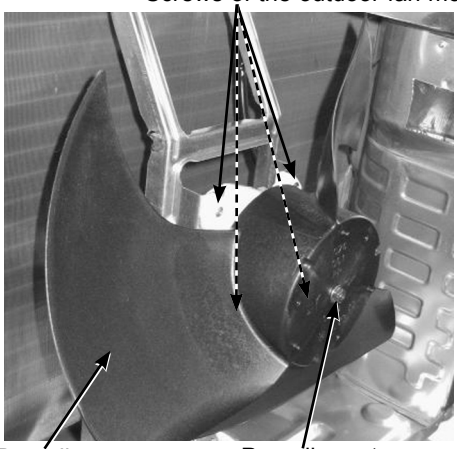
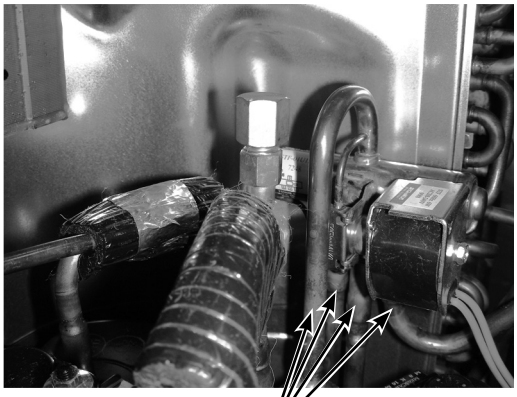

①Hold the sleeve, and pull out the terminal slowly.

## 11-1. MUZ-GE09NA MUZ-GE12NA MUZ-GE15NA MUY-GE09NA MUY-GE12NA MUY-GE15NA

**NOTE**: Turn OFF power supply before disassembly.

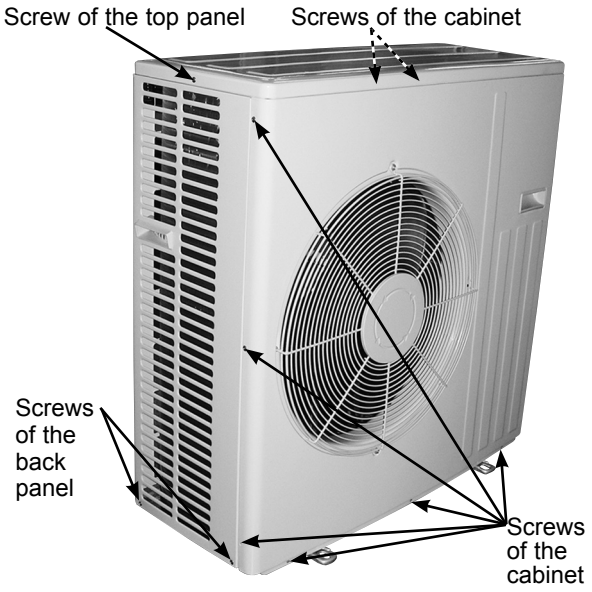
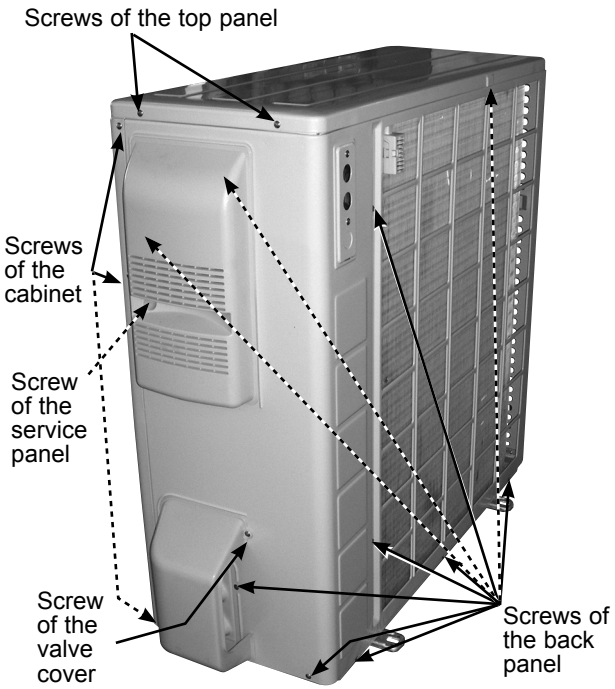
| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **1. Removing the cabinet**<br>(1) Remove the screw fixing the service panel.<br>(2) Pull down the service panel and remove it.<br>(3) Remove the screws fixing the conduit cover.<br>(4) Remove the conduit cover.<br>(5) Disconnect the power supply wire and indoor/outdoor connecting wire.<br>(6) Remove the screws fixing the top panel.<br>(7) Remove the top panel.<br>(8) Remove the screws fixing the cabinet.<br>(9) Remove the cabinet.<br>(10) Remove the screws fixing the back panel.<br>(11) Remove the back panel. | **Photo 1**<br>  <br> |
| **Photo 2**<br>  <br> | **Photo 3**<br>  <br> |

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **2. Removing the inverter assembly, inverter P.C. board**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the lead wire to the reactor and the following connectors:<br><Inverter P.C. board><br>CN721 (R.V. coil) **(MUZ)**<br>CN931, CN932 (Fan motor)<br>CN641 (Defrost thermistor **(MUZ)** and discharge temperature thermistor)<br>CN643 (Ambient temperature thermistor)<br>CN644 (Outdoor heat exchanger temperature thermistor)<br>CN724 (LEV)<br>(3) Remove the compressor connector (CN61).<br>(4) Remove the screws fixing the heat sink support and the separator.<br>(5) Remove the fixing screws of the terminal block support and the back panel.<br>(6) Remove the inverter assembly.<br>(7) Remove the screw of the ground wire and screw of the terminal block support.<br>(8) Remove the heat sink support from the P.C. board support.<br>(9) Remove the screw of the inverter P.C. board and remove the inverter P.C. board from the P.C. board support. | **Photo 4**<br>Screws of the heat sink support and the separator<br>Screws of the terminal block support and the back panel<br>  <br>**Photo 5 (Inverter assembly)**<br>  |
| **3. Removing R.V. coil (MUZ)**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the following connectors:<br><Inverter P.C. board><br>CN721 (R.V. coil)<br>(3) Remove the R.V. coil. | **Photo 6**<br>R.V. coil **(MUZ)**<br>  <br>Discharge temperature thermistor |

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the lead wire to the reactor and the following connectors:<br><Inverter P.C. board><br>CN641 (Defrost thermistor **(MUZ)** and discharge temperature thermistor)<br>CN643 (Ambient temperature thermistor)<br>CN644 (Outdoor heat exchanger temperature thermistor)<br>(3) Pull out the discharge temperature thermistor from its holder. (Photo 6)<br>(4) Pull out the defrost thermistor from its holder.<br>(5) Pull out the outdoor heat exchanger temperature thermistor from its holder.<br>(6) Pull out the ambient temperature thermistor from its holder. | **Photo 7**<br>  <br>Outdoor heat exchanger temperature thermistor<br>Defrost thermistor **(MUZ)** |
| **5. Removing outdoor fan motor**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the following connectors:<br><Inverter P.C. board><br>CN931, CN932 (Fan motor)<br>(3) Remove the propeller nut.<br>(4) Remove the propeller.<br>(5) Remove the screws fixing the fan motor.<br>(6) Remove the fan motor. | **Photo 8**<br>Screws of the outdoor fan motor<br>  <br>Propeller<br>Propeller nut |
| **6. Removing the compressor and 4-way valve**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Remove the inverter assembly. (Refer to 2.)<br>(3) Recover gas from the refrigerant circuit.<br>**NOTE:** Recover gas from the pipes until the pressure gauge shows 0 PSIG.<br>(4) Detach the brazed part of the suction and the discharge pipes connected with compressor.<br>(5) Remove the nuts of compressor legs.<br>(6) Remove the compressor.<br>(7) Detach the brazed part of the pipes connected with 4-way valve. | **Photo 9**<br>  <br>Brazed parts of 4-way valve |

## 11-2. MUZ-GE18NA MUY-GE18NA

**NOTE:** Turn OFF power supply before disassembly.

| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **1. Removing the cabinet**<br>(1) Remove the screws of the service panel.<br>(2) Remove the screws of the top panel.<br>(3) Remove the screw of the valve cover.<br>(4) Remove the service panel.<br>(5) Remove the top panel.<br>(6) Remove the valve cover.<br>(7) Disconnect the power supply and indoor/outdoor connecting wire.<br>(8) Remove the screws of the cabinet.<br>(9) Remove the cabinet.<br>(10) Remove the screws of the back panel.<br>(11) Remove the back panel. | **Photo 1**<br>  <br><br>**Photo 2**<br>  <br> |

## OPERATING PROCEDURE

**2. Removing the inverter assembly, inverter P.C. board**

(1) Remove the cabinet and panels. (Refer to 1.)
(2) Disconnect the lead wire to the reactor and the following connectors:
<Inverter P.C. board>
CN721 (R.V.coil) **(MUZ)**
CN931, CN932 (Fan motor)
CN641 (Defrost thermistor **(MUZ)** and discharge temperature thermistor)
CN643 (Ambient temperature thermistor)
CN644 (Outdoor heat exchanger temperature thermistor)
CN724 (LEV)
(3) Remove the compressor connector (CN61).
(4) Remove the screws fixing the heat sink support and the separator.
(5) Remove the fixing screws of the terminal block support and the back panel.
(6) Remove the inverter assembly.
(7) Remove the screw of the ground wire and screw of the terminal block support.
(8) Remove the heat sink support from the P.C. board support.
(9) Remove the screw of the inverter P.C. board and remove the inverter P.C. board from the P.C. board support.

**3. Removing R.V. coil**

(1) Remove the cabinet and panels. (Refer to 1.)
(2) Disconnect the following connectors:
<Inverter P.C. board>
CN721 (R.V. coil) **(MUZ)**
(3) Remove the R.V. coil.

## PHOTOS

**Photo 3**

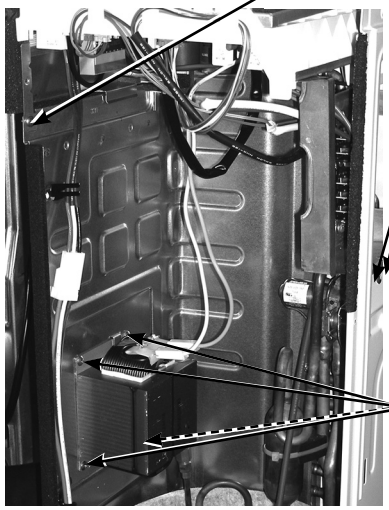

Screw of the heat sink support and the separator
Screws of the terminal block support and the back panel
Screws of the reactor

**Photo 4 (Inverter assembly)**

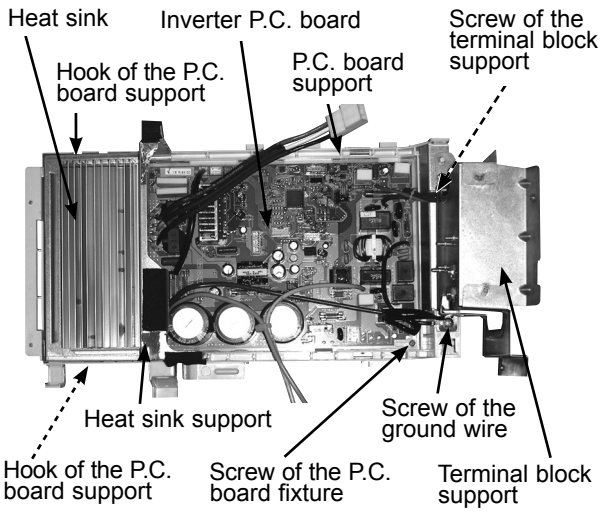
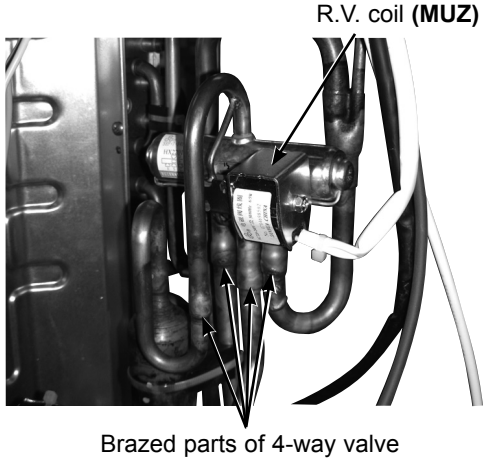

Heat sink
Inverter P.C. board
Screw of the terminal block support
Hook of the P.C. board support
P.C. board support
Heat sink support
Screw of the ground wire
Hook of the P.C. board support
Screw of the P.C. board fixture
Terminal block support

**Photo5**



## OPERATING PROCEDURE

**4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor**

(1) Remove the cabinet and panels. (Refer to 1.)
(2) Disconnect the lead wire to the reactor and the following connectors:
<Inverter P.C. board>
CN641 (Defrost thermistor **(MUZ)** and discharge temperature thermistor)
CN643 (Ambient temperature thermistor)
CN644 (Outdoor heat exchanger temperature thermistor)
(3) Pull out the discharge temperature thermistor from its holder. (Photo 8)
(4) Pull out the defrost thermistor from its holder.
(5) Pull out the outdoor heat exchanger temperature thermistor from its holder.
(6) Pull out the ambient temperature thermistor from its holder.

**5. Removing outdoor fan motor**

(1) Remove the top panel, cabinet and service panel. (Refer to 1.)
(2) Disconnect the following connectors:
<Inverter P.C. board>
CN931 and CN932 (Fan motor)
(3) Remove the propeller.
(4) Remove the screws fixing the fan motor.
(5) Remove the fan motor.

**6. Removing the compressor and 4-way valve**

(1) Remove the top panel, cabinet and service panel. (Refer to 1.)
(2) Remove the back panel. (Refer to 1.)
(3) Remove the inverter assembly. (Refer to 2.)
(4) Recover gas from the refrigerant circuit.
**NOTE:** Recover gas from the pipes until the pressure gauge shows 0 PSIG.
(5) Detach the brazed part of the suction and the discharge pipes connected with compressor.
(6) Remove the compressor nuts.
(7) Remove the compressor.
(8) Detach the brazed parts of 4-way valve and pipes. (Photo 5)

## PHOTOS

**Photo 6**

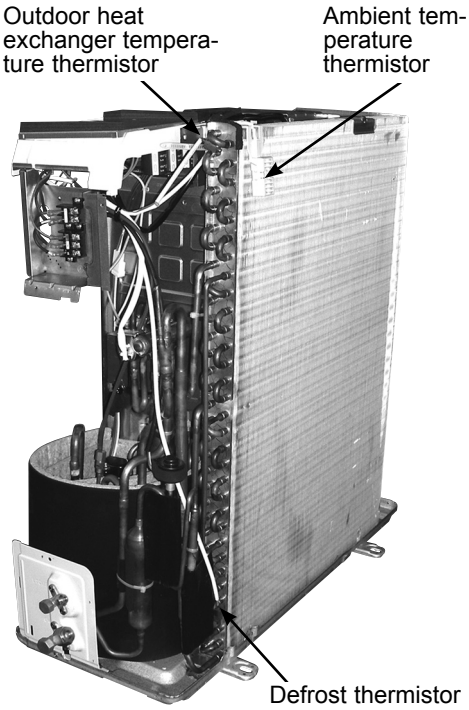



**Photo 7**

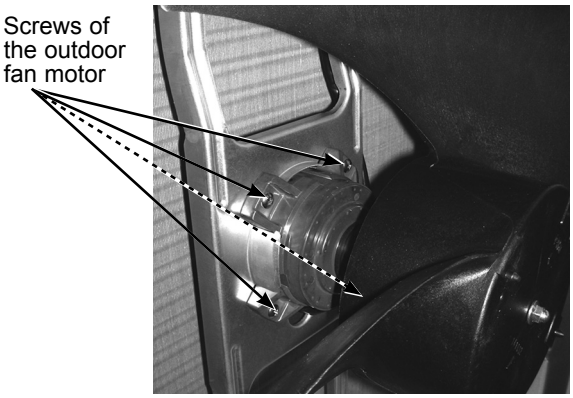
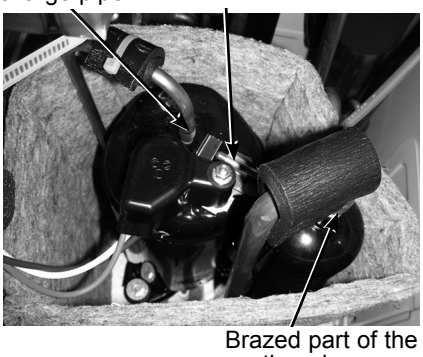



**Photo 8**



## 11-3. MUZ-GE24NA MUY-GE24NA

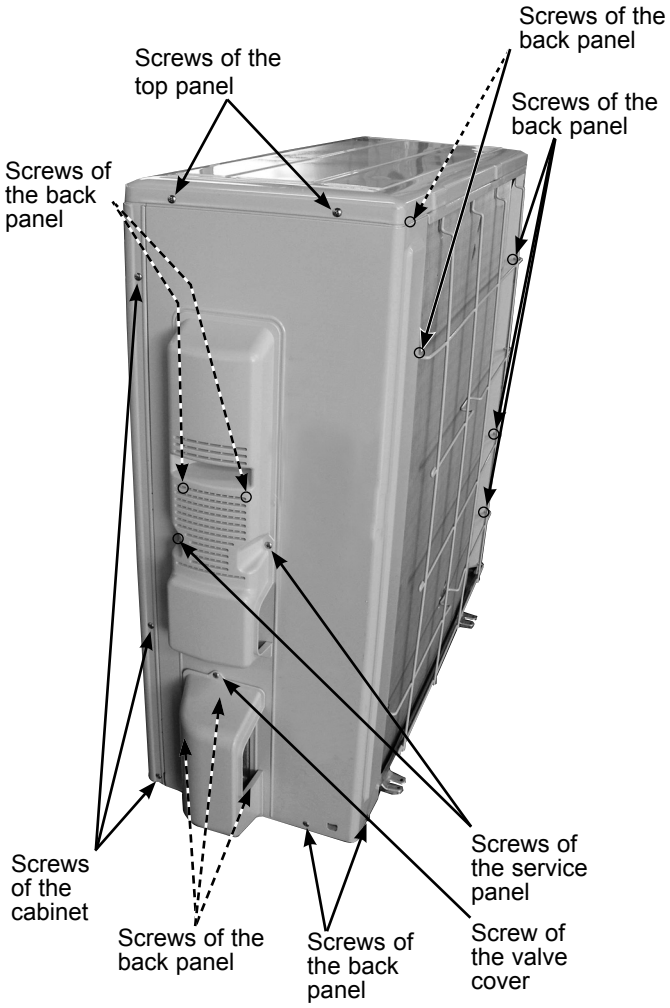
**NOTE**: Turn OFF power supply before disassembly.

### OPERATING PROCEDURE

**1. Removing the cabinet**

(1) Remove the screws of the service panel.
(2) Remove the screws of the top panel.
(3) Remove the screw of the valve cover.
(4) Remove the service panel.
(5) Remove the screws fixing the conduit cover.
(6) Remove the conduit cover.
(7) Remove the top panel.
(8) Remove the valve cover.
(9) Disconnect the power supply and indoor/outdoor connecting wire.
(10) Remove the screws of the cabinet.
(11) Remove the cabinet.
(12) Remove the screws of the back panel.
(13) Remove the back panel.

**Photo 2**


Screws of the back panel
Screws of the top panel
Screws of the back panel
Screws of the back panel
Screws of the cabinet
Screws of the service panel
Screw of the valve cover
Screws of the back panel
Screws of the back panel

### PHOTOS

**Photo 1**

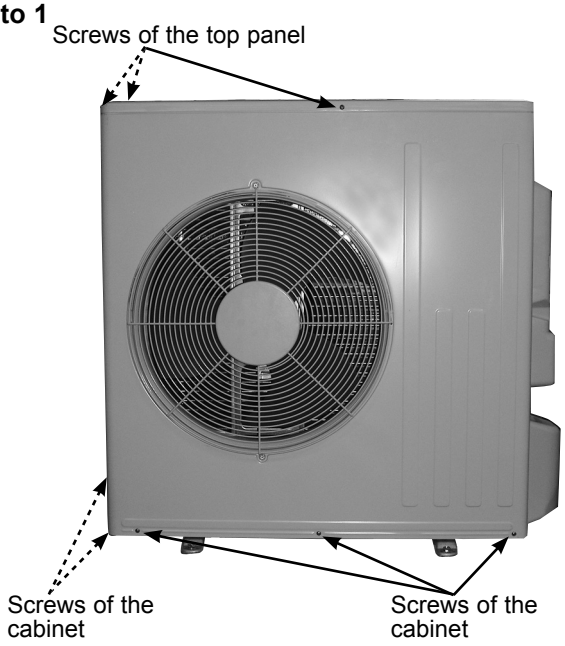
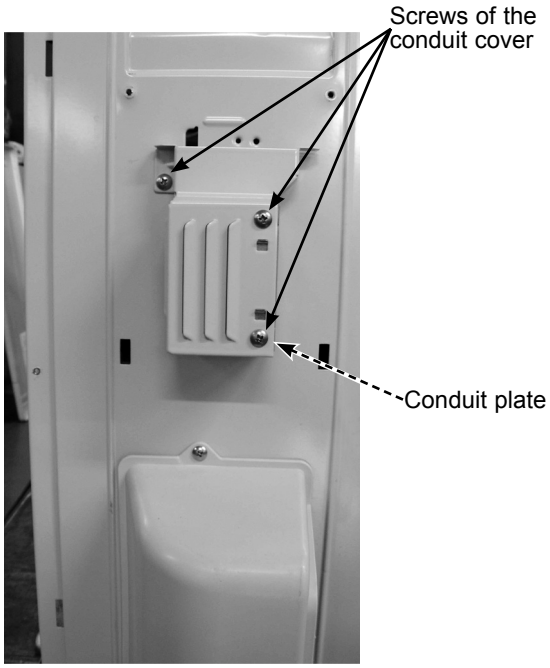
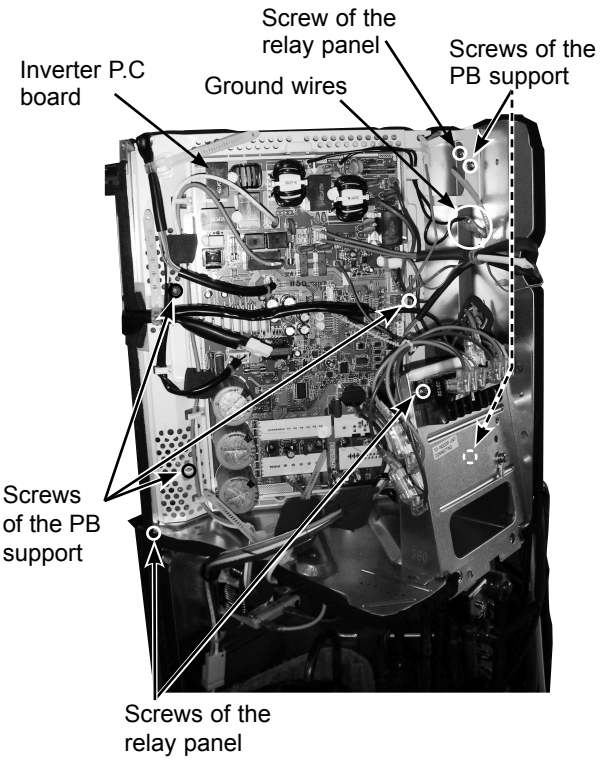
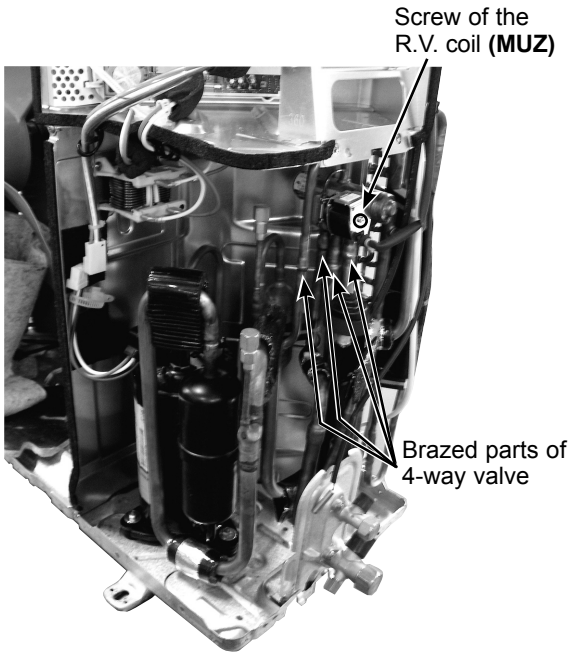



**Photo 3**



| OPERATING PROCEDURE | PHOTOS |
|---|---|
| **2. Removing the inverter assembly, inverter P.C. board**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the lead wire to the reactor and the following connectors:<br><Inverter P.C. board><br>CN602 (R.V. coil)<br>CN931, CN932 (Fan motor)<br>CN671 (Defrost thermistor, discharge temperature thermistor and outdoor heat exchanger temperature thermistor)<br>CN672 (Ambient temperature thermistor)<br>CN724 (LEV)<br>(3) Remove the compressor connector.<br>(4) Remove the screws fixing the relay panel.<br>(5) Remove the relay panel.<br>(6) Remove the ground wires and the lead wires of the inverter P.C. board.<br>(7) Remove the screw of the PB support.<br>(8) Remove the inverter P.C. board from the relay panel. | **Photo 4**<br>  <br> |
| **3. Removing R.V. coil**<br>(1) Remove the cabinet and panels. (Refer to 1.)<br>(2) Disconnect the following connector:<br><Inverter P.C. board><br>CN602 (R.V. coil) **(MUZ)**<br>(3) Remove the R.V. coil. | **Photo 5**<br>  <br> |

## OPERATING PROCEDURE

**4. Removing the discharge temperature thermistor, defrost thermistor, outdoor heat exchanger temperature thermistor and ambient temperature thermistor**

(1) Remove the cabinet and panels. (Refer to 1.)
(2) Disconnect the lead wire to the reactor and the following connectors:
<Inverter P.C. board>
CN671 (Defrost thermistor **(MUZ)**, discharge temperature thermistor and outdoor heart exchanger temperature thermistor)
CN672 (Ambient temperature thermistor)
(3) Pull out the discharge temperature thermistor from its holder. (Photo 8)
(4) Pull out the defrost thermistor from its holder.
(5) Pull out the outdoor heat exchanger temperature thermistor from its holder.
(6) Pull out the ambient temperature thermistor from its holder.

**5. Removing outdoor fan motor**

(1) Remove the top panel, cabinet and service panel. (Refer to 1.)
(2) Disconnect the following connectors:
<Inverter P.C. board>
CN931 and CN932 (Fan motor)
(3) Remove the propeller.
(4) Remove the screws fixing the fan motor.
(5) Remove the fan motor.

**6. Removing the compressor and 4-way valve**

(1) Remove the top panel, cabinet and service panel. (Refer to 1.)
(2) Remove the back panel. (Refer to 1.)
(3) Remove the inverter assembly. (Refer to 2.)
(4) Recover gas from the refrigerant circuit.
**NOTE:** Recover gas from the pipes until the pressure gauge shows 0 kg/cm$^2$ (0 MPa).
(5) Detach the brazed part of the suction and the discharge pipes connected with compressor.
(6) Remove the compressor nuts.
(7) Remove the compressor.
(8) Detach the brazed parts of 4-way valve and pipes. (Photo 5)

## PHOTOS

**Photo 6**

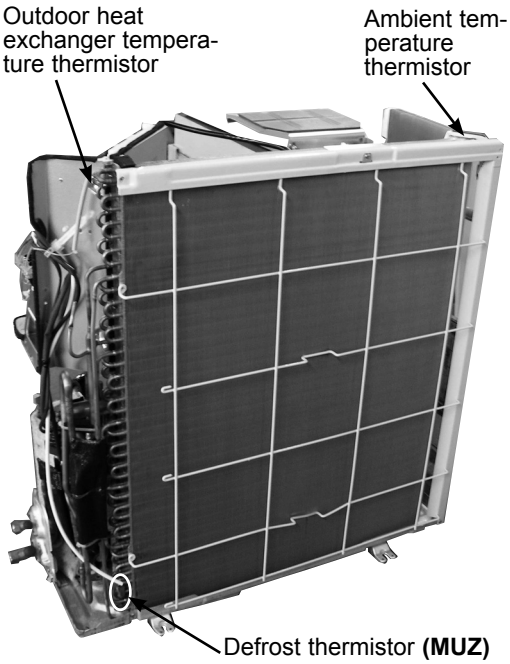



**Photo 7**

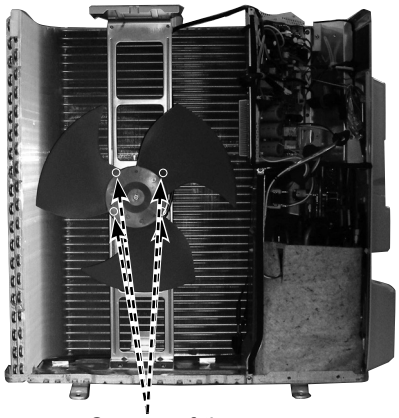
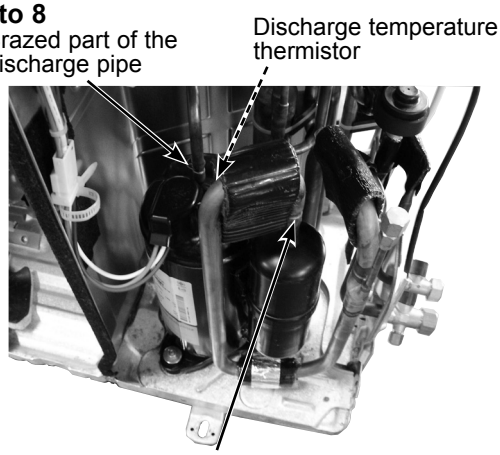



**Photo 8**



Mr.SLIM™

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**Distributed in Dec. 2010. No. OBH 549 REVISED EDITION-B**
**Distributed in Sep. 2010. No. OBH 549 REVISED EDITION-A 5**
**Distributed in Jul. 2009. No. OBH 549 5**
**Made in Japan**

New publication, effective Dec. 2010
Specifications subject to change without notice.